

ADF&G TECHNICAL DATA REPORT NO. 106  
(Limited Distribution)

STATE OF ALASKA  
Bill Sheffield, Governor

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## REVISED ANADROMOUS STREAM CATALOG OF SOUTHEASTERN ALASKA

District 106

North Prince of Wales Island

Volume II

By:  
John Edgington  
and  
Ted Mickowski

February 1984

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ALASKA DEPARTMENT OF FISH AND GAME  
P.O. Box 3-2000, Juneau, Alaska 99802

Don W. Collinsworth  
Commissioner

## ADF&G TECHNICAL DATA REPORTS

This series of reports is designed to facilitate prompt reporting of data from studies conducted by the Alaska Department of Fish and Game, especially studies which may be of direct and immediate interest to scientists of other agencies.

The primary purpose of these reports is presentation of data. Description of programs and data collection methods is included only to the extent required for interpretation of the data. Analysis is generally limited to that necessary for clarification of data collection methods and interpretation of the basic data. No attempt is made in these reports to present analysis of the data relative to its ultimate or intended use.

Data presented in these reports is intended to be final, however, some revisions may occasionally be necessary. Minor revisions will be made via errata sheets. Major revisions will be made in the form of revised reports.

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## **Explanation**

This report contains no Table of Contents, Abstract, or any other means of determining what the content is. So I went through the report, and determined that it consists of a catalog of various streams. With this in mind, I set my bookmarks for the PDF file to the individual streams categorized in the report. I then organized the listings by the Bay/Drainage listed for each stream.

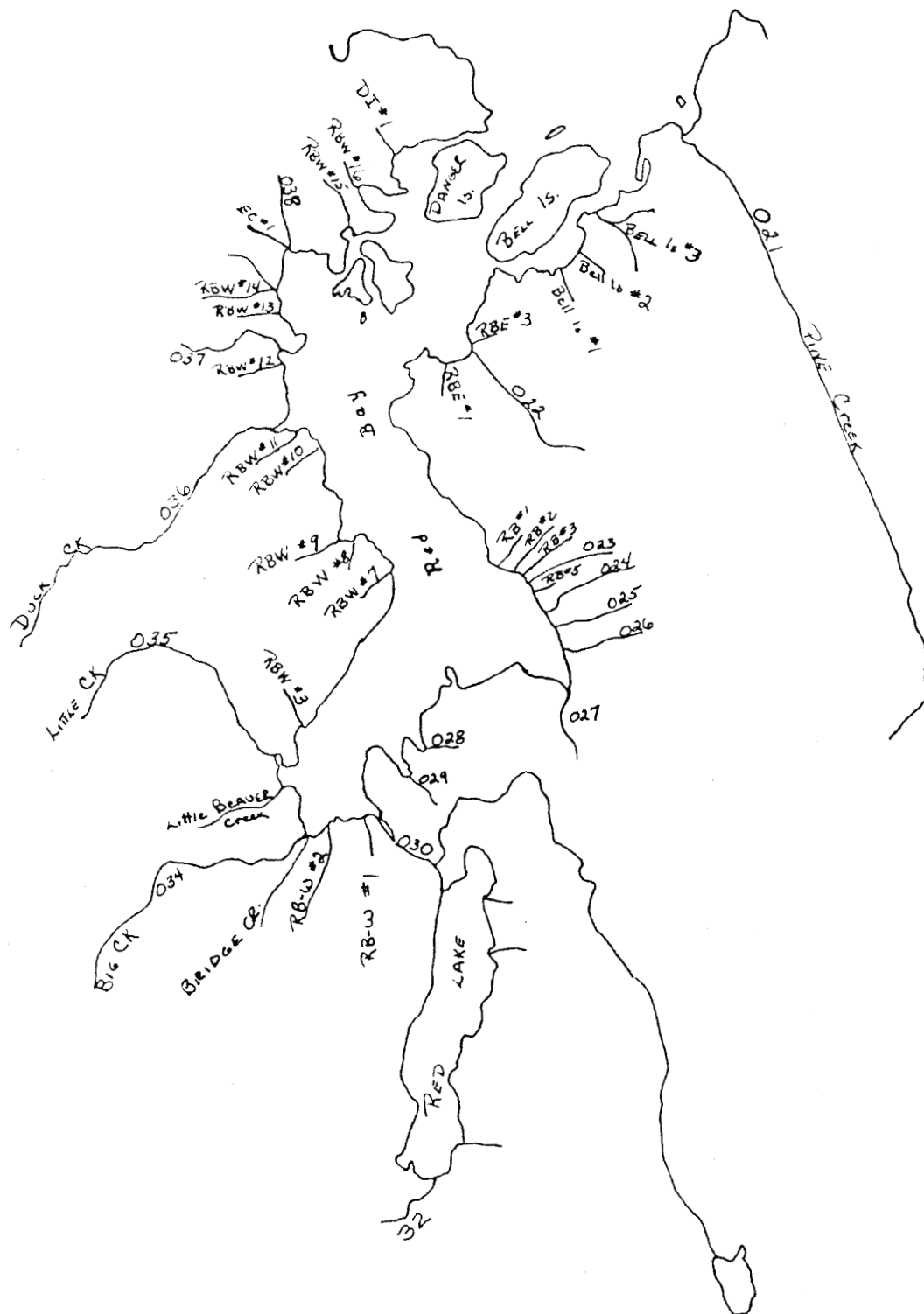
Mae Tanner  
July 21, 2006



# PRINCE OF WALES ISLAND

# S U M N E R

## S T R A I T



# LIVELIQUID - INITIAL DATA FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

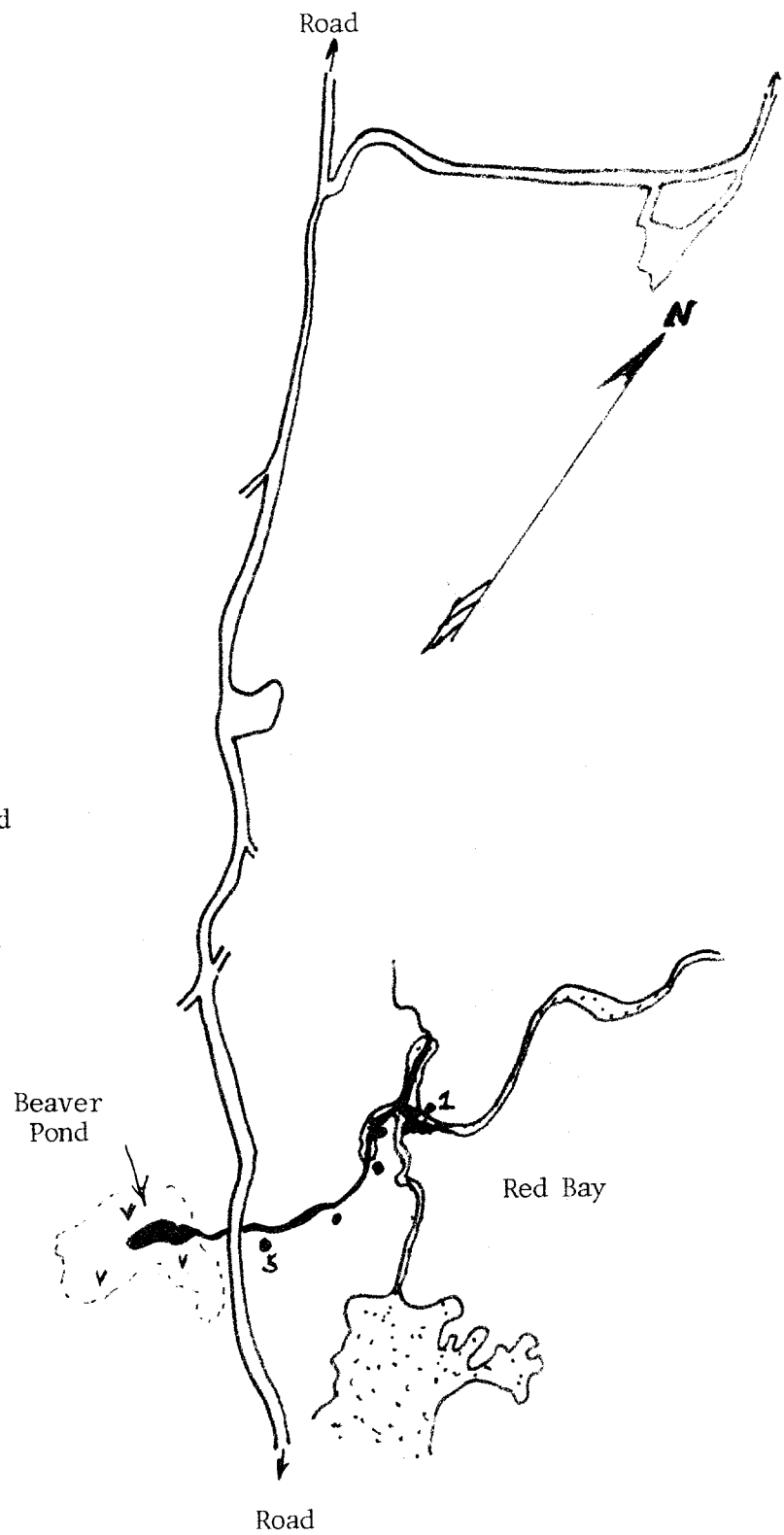
1. Survey Areas A
2. Equipment N/A
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Little Beaver Creek
2. ADI&G Catalog No. N/A
3. Lat. 56°16'00"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-5
7. Aerial Photo No. 71-17-9-28
8. Bay/Drainage Red Bay
9. Access 1, 4, 6
10. Camping 4
11. Present Land Use a. Upland logging road
- 11b. Game trails
12. Historical Land Use None
13. Stream Origin 3 4 5 6
14. Flow Stage 2
15. Flow E, 3.9, .044, 10, .9, 61.42, --, .91 cfs  
method width depth length constant time grid flow
16. Temp. Sensitivity Beaver impoundments
17. Beaver 2
18. Type aquatic Veg. 4, 2
19. Density Aquatic Veg. 2
20. Adult Salmon No
21. Intertidal a. gradient 0.5
- b. bottom type % fines 80%
- c. ASA Poor
- gravel small cobble 20%
- d. schooling High Tide Only/
- large cobble/boulders/bedrock 0 %
- e. shellfish Yes Red Bay
- f. Anchorage in bay, extensive mud flats at mouth.
22. Comments  
Small unnamed, uncatalogued stream draining into 106-41-35's intertidal zone from the SW. Characterized by a primarily muck substrate, dense vascular plant colonization and continuous beaver impoundments. Overall, moderate rearing and marginal spawning habitat. Several juvenile dungeness crabs and moderate densities of clams were observed in the intertidal zone. Several large concentrations of clam shells were observed in Section 3, above the intertidal zone.
23. Investigators Mickowski/Merrigan
24. Date 9 /15 /82
25. Time 1000 1750  
start end
26. Weather 3, 5
27. Photos

R-10 2600-3a (1/81)

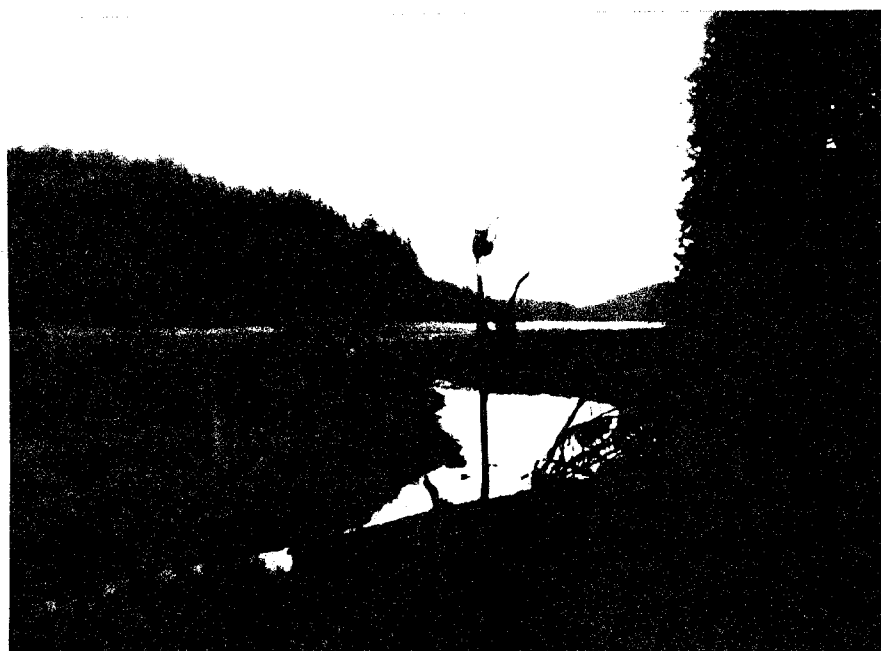
Little Beaver Creek  
Prince of Wales Island



# Little Beaver Creek



1. Lower ITZ Viewed From Confluence With ITZ of Little Creek.



2. Downstream View of ITZ Looking Toward Red Bay.

Little Beaver Creek



3. Upper ITZ and Mouth With Grass in Substrate.



4. Begin First in a Series of Beaver Impoundments,  
Section 3: 97m.

# Little Beaver Creek

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
2I	100	1.3	3	3.9					
3	100	1.0	5	5					
4	100	1.5	1	<u>1.5</u>					
Total				10.4m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Little Beaver Creek ADF&G Catalog No. N/A

1. Section No.	11	21	3	4	5			
2. Compass Bearing	135	195	191	205	125			
3. Gradient	.5	1	1	6	3			
4. Temperature: Air	15	15	15	15	16			
Water	12	12	12	12	12			
5. Water qual: a. color	3	3	3	3	3			
b. turbidity	1	1	1	1	1			
c. pH	--	--	7.8	7.8	7.7			
6. Streambottom Substrate	1	--	--	1	--			
	2	--	--	2	2			
	3	5	5	10	8			
	4	20	45	34	17			
	5	30	20	20	10			
	6	45	30	30	55			
	7	--	--	a) 2 b) 1	b) 3 c) 5			
7. ASA a. percent	--	3	5	1	--			
b. quality	--	1	1	1	--			
8. Water Width a. channel	7.2	7.1	12	6.2	12			
b. water	4.1	1.3	1	1.5	12			
c. floodplain	1	1	1	1	1			
9. Stream Pools a. percent	45	60	60	65	100			
b. category	SF/SS	SS/SF	SS/DS	DS	DS			
10. Rearing Area	15	35	40	65	100			
11. Debris Loading	2	4	5	20	20			
12. Potential Barriers	N	N	N	Y	N			
13. Enhancement/Rehab	N	N	N	N	N			
14. Streambank Veg.	5	5	1-3,5	1,3,5	1,3,5			
15. Upper Bank a. Left	18	3	20	25	35			
b. Right	22	3	12	11	20			
b. indic Left	N	N	N	N	N			
Right	N	N	N	N	N			
c. veg Left	N	N	N	N	N			
Right	N	N	N	N	N			
16. Lower Bank Left	GS	GS	U	GS	SS			
Right	GS	GS	U	GS	SS			
17. Stab rating Left	1(1)	1(1)	1(1)	1(1)	1(1)			
Right	1(1)	1(1)	1(1)	1(1)	1(1)			
18. Stream Canopy Cover	1	1	1	1	1			
19. Fish Species	SS	>6	<20	>25	<5			
	CT	N	1	N	N			
	DV	N	1	N	N			
	CO	6	6	7	N			
20. Sampling	N	Y	Y	N	Y			

## 21. Comments

Section 11: Typically a heavily "silted" substrate with pockets of clay. Fucus and marine algae sparse, clams moderate. 70m; Blue clay deposits, patchy for 30 meters.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

- Section 2I: Dense salt grass in and along channel throughout.  
10m; Left undercut, failing banks. Blue clay deposits;  
patchy for 90 meters.
- Section 3: Intertidal zone ends. Dense grass in and along channel  
and localized bank failures throughout.  
55m; Left undercut bank; 5m by 5m.  
97m; Old broken out beaver dam.  
100m; Instream marble along left bank, 15m by 2m.
- Section 4: 41m; 1.3 by 22m inactive beaver dam in good repair; potential  
anadromous barrier; no holding pools beneath.  
75m; 1m by 21m inactive beaver dam in good repair. No fish  
observed within impoundments.
- Section 5: 25m; Impoundment crossed by mainline logging road #1000 via  
1.3m diameter culvert.  
50m; 1.5m by 18m inactive beaver dam in good repair.  
100m; End of survey. An extensive headwater pond/marsh system  
extends beyond survey's end. No fish were observed.

# FISH SAMPLING FORM

Stream Name Little Beaver Ck. ADF&G Catalog No. N/A Date 9/15/82

Identify Survey Area A Water Temp. 12°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1112	1252	2 SS	60, 65	Trap set in Section 2I, along right undercut bank near debris.
			6 CO	--	
2	1129	1300	1 SS	78	Trap set in Section 3, pool, along right undercut bank near debris.
			1 DV		
			7 CO		
3	1157	1241	--	--	Trap set in Section 5; 16m under root wad and along right bank. Site located just above mainline logging road; culvert in beaver impoundment.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

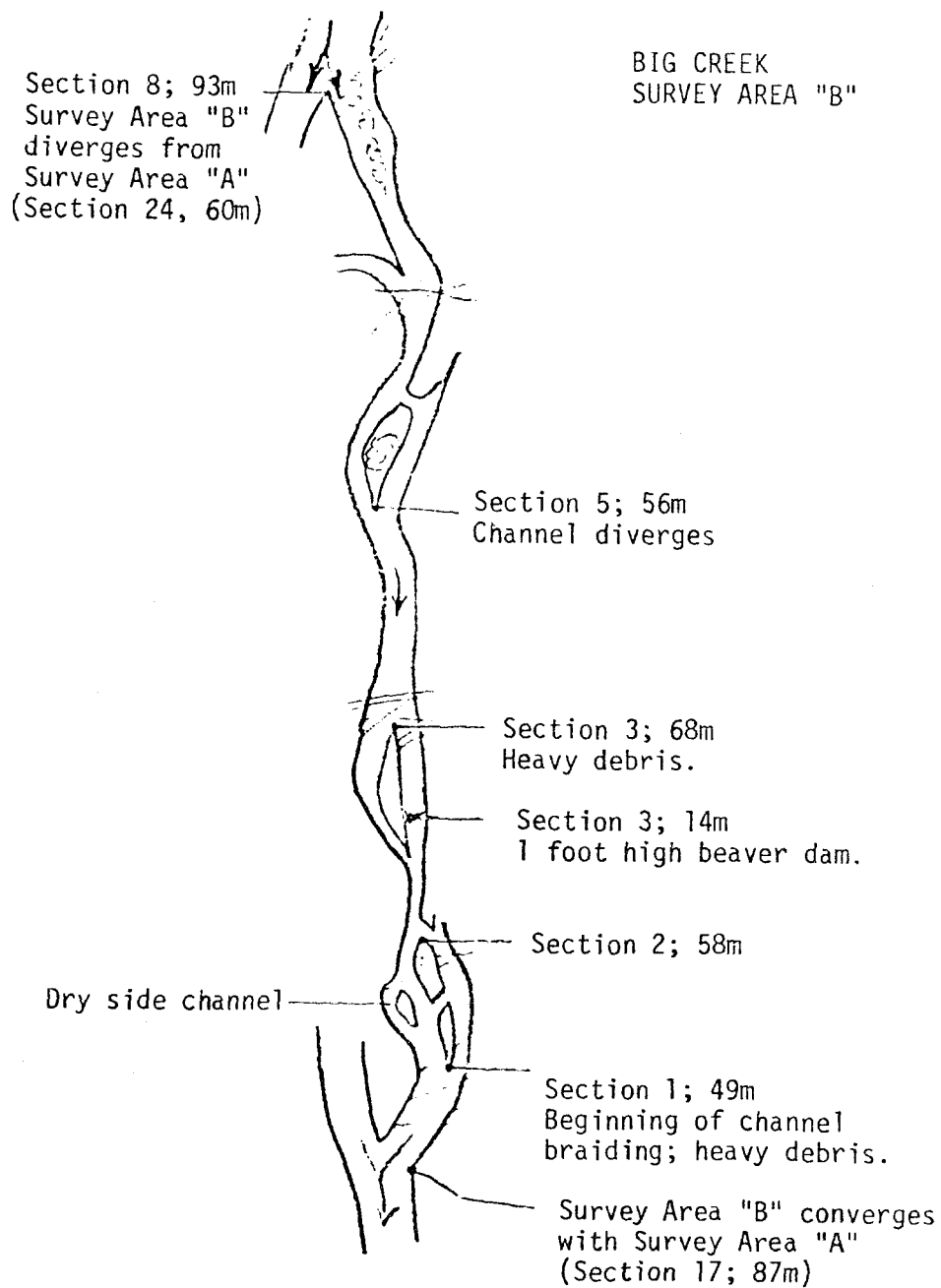
Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A,B,C,D,E 2. Equipment X
3. Historical Fish Species RS PS CS SS
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

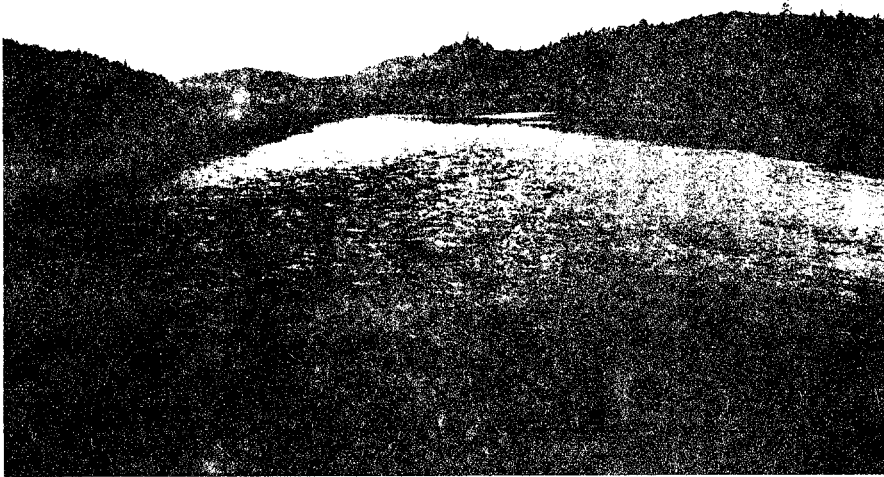
1. Stream Name Big Creek 3. Lat. 56°15'45"
  2. ADF&G Catalog No. 106-41-34 3. Long. 133°20'30"
  4. Agency Unit 05 5. Mgmt Area 533 K 6. USGS Map No. Petersburg B-5
  7. Aerial Photo No. 71-17-9-27 71-17-9-28 71-16-9-44 71-16-9-45
  8. Bay/Drainage Red Bay 9. Access 1-6 10. Camping 4
  11. Present Land Use a. Bridge crossing & logging units along left & right 11b. Game trails, bear and deer sign.
  12. Historical Land Use banks. None observed.
  13. Stream Origin 3 4 5 6 14. Flow Stage 1
  15. Flow Em, 7.67m, 0.077m, 24m, 0.8, 23.97, --, 0.47m<sup>3</sup>/sec.  
method width depth length constant time grid flow
  16. Temp. Sensitivity None
  17. Beaver 1 18. Type aquatic Veg. 1 19. Density Aquatic Veg. 1
  20. Adult Salmon Y 21. Intertidal a. gradient 2%  
b. bottom type % fines 16 % c. ASA 28%  
gravel small cobble 73 % d. schooling Y  
large cobble/boulders/bedrock 11 % e. shellfish Y  
f. No anchorage nearby; must anchor to right or left of tide flats.
  22. Comments  
21d. Schooling areas in intertidal zone and in deep pools in lower stream area.  
21e. Clams and Dungeness crabs in small amounts.
- \*Area A, Section 11-20 Date: 8/28/82 Time: 0920-1720 Weather: 5, 2  
B }  
A } Section 20-41: " 8/30/82 " 0900-1730 " 6, 1  
C,D,E Chopper Survey " 9/28/82 " 1300-1530 " 2
23. Investigators Murph/Mickowski
  24. Date 8 / 29 / 82 25. Time 0920 1720 26. Weather 5, 2  
start end
  27. Photos

R-10 2600-3a (1/81)

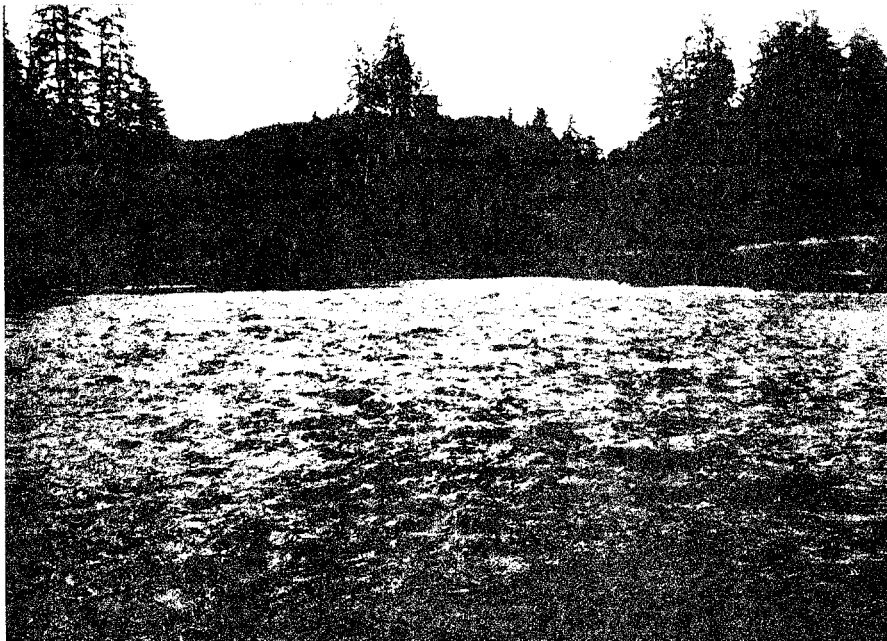


Not Drawn to Scale

Big Creek  
106-41-34

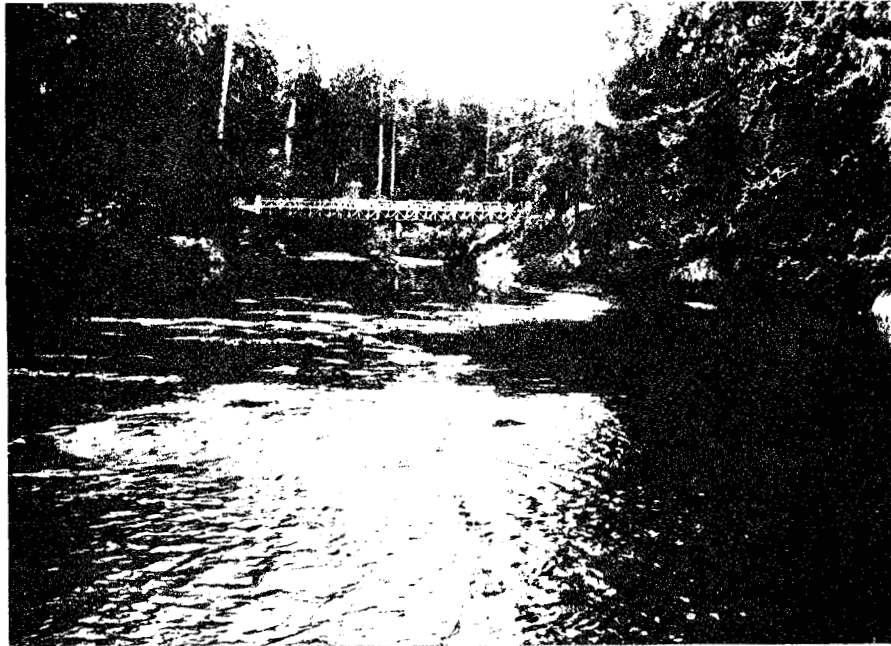


1. Downstream View of Lower ITZ With Confluence of Bridge Creek, Right Side.



2. Upper ITZ Riffle With Compacted Small Cobble/Gravel Substrate.

Big Creek  
106-41-34

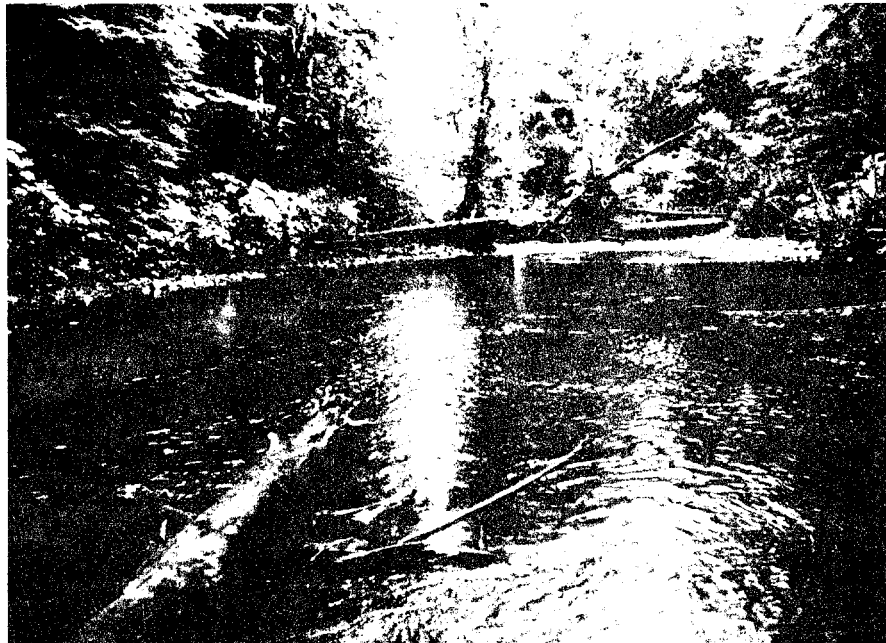


3. Bridge Crossing With Excellent Spawning Area.  
Pinks on Redds, Foreground.



4. Big Creek. Pool/Riffle Area Above Bridge.

Big Creek  
106-41-34



5. Section 16: Downstream View of Cobble Channel. Debris Induced Cover Provides Excellent Rearing Habitat.

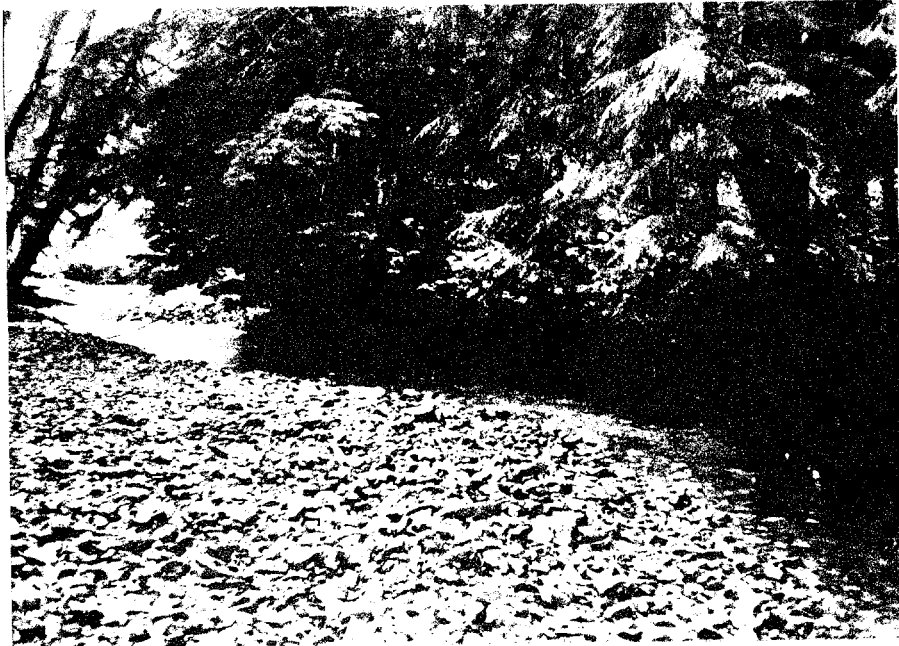


6. Section 17: Cobble riffles and Blowdown Induced Debris Provide Isolated Spawning and Moderate to Excellent Rearing.

Big Creek  
106-41-34



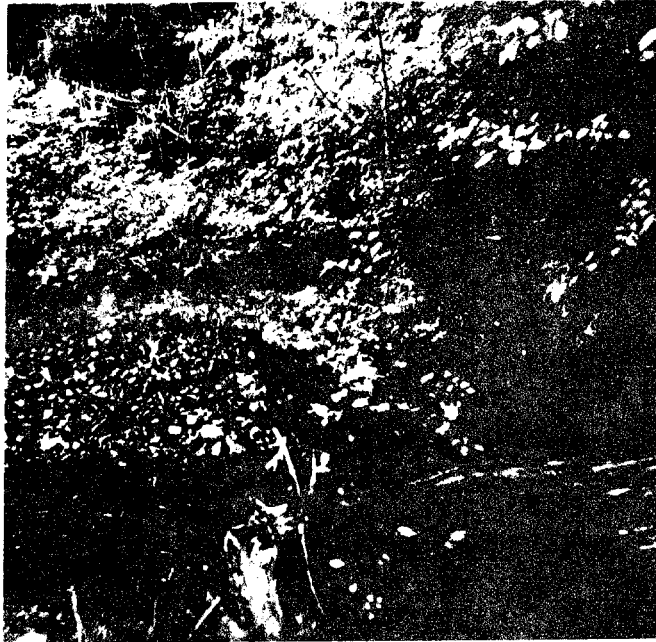
7. Section 17: The Confluence of Survey Area "B" (Right) and Survey Area "A" Occurs at 87 m. Cobble Riffles Provide Good ASA. Dense Debris Loading in Area "B" Creates Cover and Pools for Rearing Fish.



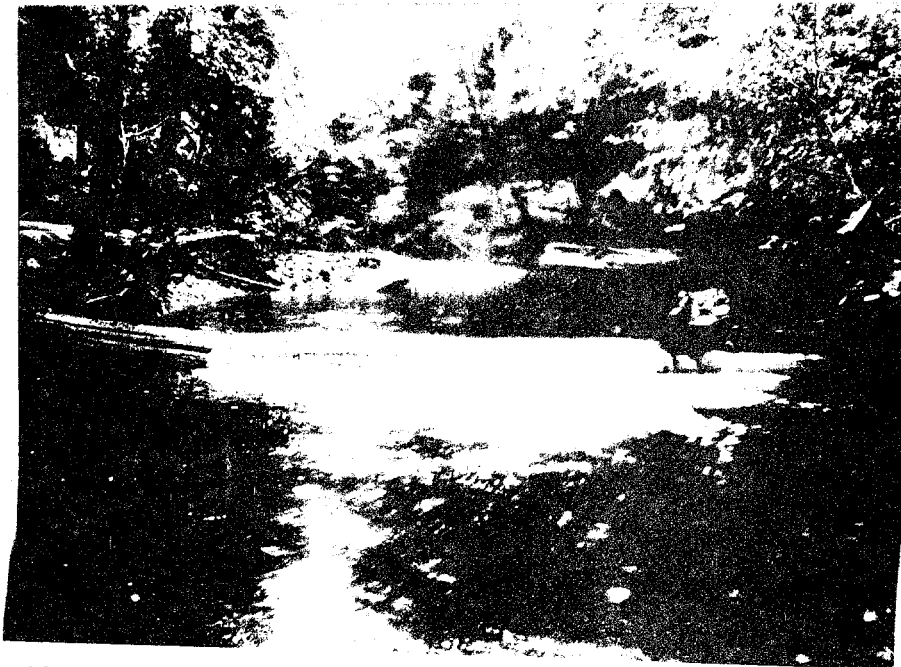
8. Section 26: Coarse Substrate Limits Spawning Area, but Debris Induced Pools and Undercut Banks Provide Excellent Rearing Habitat.



Big Creek  
106-41-34



9. Section 26: An Active Beaver Impoundment Flows 1.5 m Into a Side Channel.



10. Section 35: Instream Log Forming Rearing Pool With Large Cobble Substrate.

Big Creek  
106-41-34

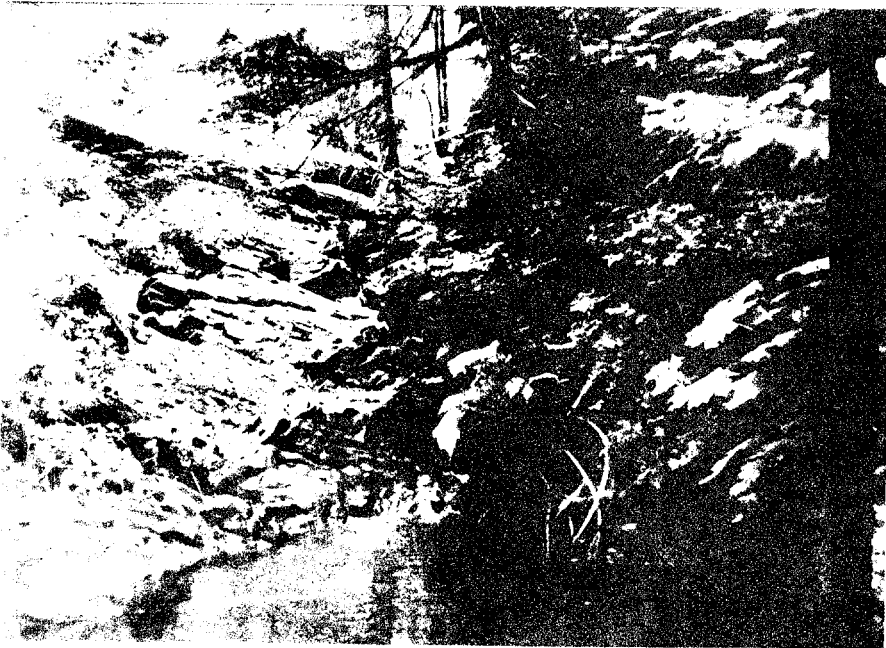


11. Downstream View of Section 35. Channelized Stream Flow Through Steep Banks Over Cobble/Boulder Substrate.

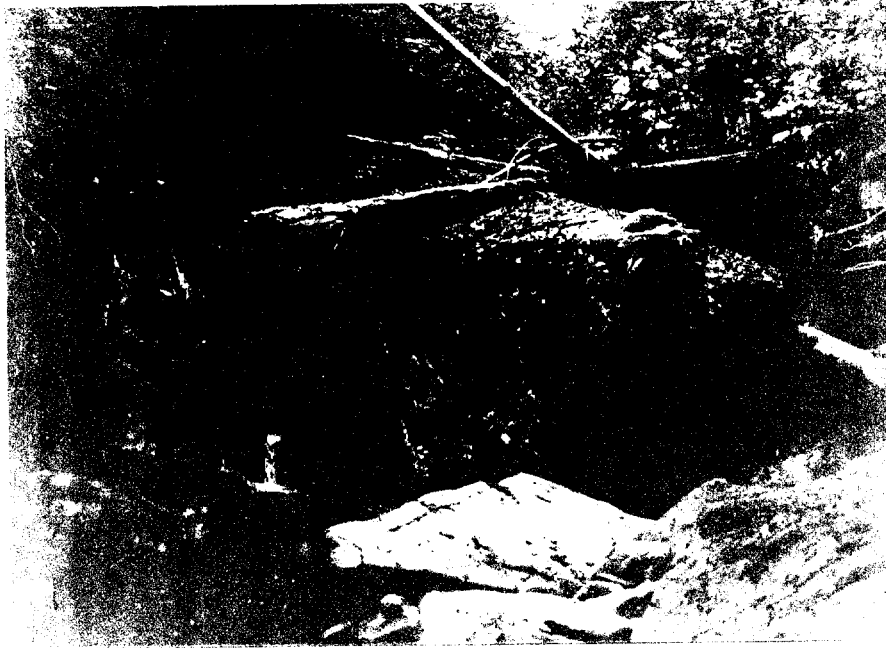
106-41-34  
Survey Area "C"



1. Section 1: Typical Stream Habitat of Bedrock/  
Cobble Substrate.



2. Section 4: 75m; Habitat Change as Stream Enters  
V-notch and Flows Over a Steep Gradient,  
Cascading Over Bedrock.



1. Survey Area D: 18m Beyond the End of Section 3, Bedrock Slabs Have Slid Into the Channel From the Notch Walls Forming a 3.0 Vertical Meter Barrier Falls.



2. Survey Area D; Section 3: Bedrock/Boulder Cascades are the Predominant Habitat Association.

106-41-34  
Survey Area "E"



1. Section 1: 30m; A Bedrock/Cobble Strewn Channel Typifies "Available Habitat".



2. Section 5: 27.5m; 3.0 Vertical Meter Barrier Falls Demarcates Survey End.

Big Creek  
106-41-34

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Area A					27	100	7.3	10	73
1I	100	14.5	50	725	28	100	13	7	9.1
2I	100	21.5	5	107.5	29	100	4.4	5	22
3I	100	8.2	40	328	30	100	9	5	45
4I	100	18.7	17	317.9	34	100	7.6	3	22.8
5	100	21	5	105	36	100	7	3	21
6	100	11.4	20	228	37	100	13	5	65
7	100	9.6	20	192	38	100	16	2	32
8	100	7	15	105	41	100	12	3	36
9	100	5.65	20	113	Total				5,065.4m <sup>2</sup>
10	100	6.2	60	372	Area B				
11	100	6	25	150	1	100	3.25	10	32.5
12	100	7.5	30	225	2	100	3.2	10	32
13	100	18	17	306	4	100	5.2	15	78
14	100	5	15	75	5	100	3.7	10	37
15	100	6.8	40	272	6	100	7	2	14
16	100	13.9	3	41.7	7	100	2.8	7	19.6
17	100	16.8	5	84	8	100	3.15	2	6.3
18	100	5	5	25	Total				219.4m <sup>2</sup>
19	100	6.8	18	122.4	Area C				
20	100	6.5	18	117	1	100	12	1	12
21	100	24	10	240	2	100	12	3	36
22	100	7	25	175	3	100	2.3	10	23
23	100	10.8	20	216	4	100	4.2	5	21
24	100	4.4	5	22	Total				92m <sup>2</sup>
25	100	7.5	10	75					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area A ADF&G Catalog No. 106-41-34

1. Section No.	1I	2I	3I	4I	5	6	7	8
2. Compass Bearing	165	180	193	169	149	141	210	213
3. Gradient	1.5	1	2.5	1.5	1.5	2	2	1.5
4. Temperature: Air	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
Water	11	11	11	11	11	11	11	11
5. Water qual: a. color	1	1	1	1	1	1	1	1
b. turbidity	1	1	1	1	1	1	1	1
c. pH	--	--	--	--	7.5	7.5	7.5	7.5
6. Streambottom Substrate	1	--	--	--	2	--	--	--
	2	10	10	10	15	10	18	20
	3	55	55	45	45	55	50	50
	4	25	20	25	23	25	25	20
	5	10	15	20	15	8	5	6
	6	--	--	--	--	--	--	--
	7	--	--	--	--	b) 2	b) 2	b) 2 c) 3
7. ASA a. percent	50	5	40	17	5	20	20	15
b. quality	2	2	2	1	1	1	1	1
8. Water Width a. channel	21.7	25	16.5	24	31	12	10.1	21.5
b. water	14.5	21.5	8.2	18.7	6 / 15	11.4	9.6	7
c. floodplain	3	3	3	2	1	2	2	2
9. Stream Pools a. percent	20	85	50	80	75	65	65	65
b. category	SS/SF	SS	SS	SS/DS	SS/DS	SS/SF	DS/SS	DS/SS
10. Rearing Area	2	--	4	10	60	35	45	45
11. Debris Loading	1	2	2	5	9	7	9	9
12. Potential Barriers	N	N	N	N	N	N	N	N
13. Enhancement/Rehab	N	N	N	N	N	N	N	N
14. Streambank Veg.	5	5	1.5	1.3.5	1-3.5	1-3.5	1.2.3	1-5
15. Upper Bank a. Left	0	0	0	0	11	4	0	0
b. Right	0	0	0	0	8	15	0	0
b. indic Left	N	N	N	N	N	N	N	*
Right	N	N	N	N	N	N	N	N
c. veg Left	N	N	N	N	N	N	N	N
Right	N	N	N	N	N	N	N	N
16. Lower Bank Left	GS	U	U	U	U	U	U	U
Right	SS	U	GS	U	U	U	U	U
17. Stab rating Left	1(2)	1(2)	1(1)	1(1)	2(1)	2(1)	1(1)	1(2)
Right	1(1)	1(1)	1(2)	1(1)	1(1)	1(1)	1(2)	2(1)
18. Stream Canopy Cover	3	3	3	3	3	3	1	2
19. Fish Species	CO	1	20+	>12	10	--	--	--
Adult	CS	--	10+	10+	12+	200	30+	15+
Adult	PS	--	--	4	6	6	2	--
Adult/juv.	DV	--	--	1/-	20+/-	- / >12	- / >6	- / >12
Adult/juv.	SS	--	--	--	2/-	--	1/-	- / >12
20. Sampling	N	N	N	N	N	N	N	Y

21. Comments \*Thin soil

Section 1I: 0m; Survey begun at treeline on the left bank, 40m above the intertidal zone confluence with Bridge Creek.  
A clearcut borders left bank from 0m to the bridge crossing in Section 4I, 27m.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

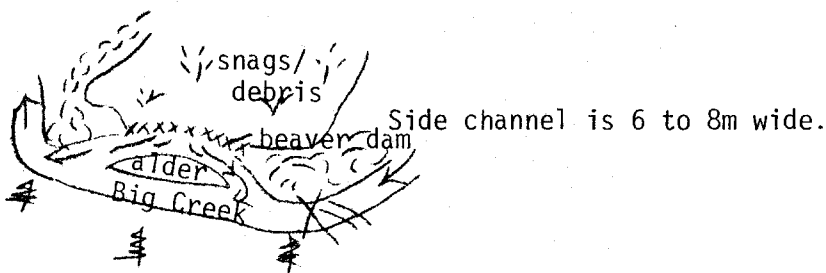
Section 2I: 11.5m; Dry flood channel converges on right side and diverges in Section 3I, 39m.

Section 3I: 0m; Treeline begins on right bank.  
22m; Small tributary on left side with 50% rearing area in pools and 1% poor ASA in very silty cobble substrate. 140m above confluence with main stem is an active beaver dam in good repair in a clearcut unit. 11°C water temperature. Stream passes through a metal culvert at road crossing approximately 100m upstream. Excellent intertidal spawning area in Section 3I being used by CS and PS.

Section 4I: 27m; #1000 road bridge crossing (mainline road out of Labouchere Bay to Red Bay) using a metal expansion bridge.  
40m; Clearcut begins on right stream bank.  
53m; End of intertidal zone.

Section 5: 81m; End of clearcut on the right streambank. A long flood channel extends along the left bank. A dead eagle found on gravel bar in channel. Red tail hawk observed in tree along bank (1130 hrs).

Section 6: 84m; Side channel converges on left with less than 1 cfs flow. An active beaver dam forms left lower bank of side channel 34.5m upstream. Impoundment takes in a large floodplain area with copious debris and snags. Side channel flow is from the beaver dam system.





# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area A ADF&G Catalog No. 106-41-34

1. Section No.		9	10	11	12	13	14	15	16
2. Compass Bearing		206	174	212	214	253	181	197	205
3. Gradient		2.5	2	2	2	2	2	2	2.5
4. Temperature: Air		13	13.5	13.5	14	15.5	15.5	15.5	15
	Water	11	11	11	11	11.5	11.5	11.5	11.5
5. Water qual: a. color		1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
6. Streambottom Substrate	1	--	--	--	--	--	--	--	--
	2	10	5	8	18	20	18	25	30
	3	55	65	48	50	45	40	50	40
	4	25	20	30	25	25	25	20	20
	5	5	5	7	5	7	10	4	8
	6	--	--	--	--	--	--	--	--
	7	b) 2 c) 3	b) 2 c) 3	b) 3 c) 4	b) 1 c) 1	b) 2 c) 1	a) 4 b) 1 c) 2	b) 1	b) 2
7. ASA a. percent		20	60	25	30	17	15	40	3
	b. quality	1	1	1	1	2	1	1	1
8. Water Width a. channel		33.5	16.7	45	16.5	27	15.5	22	20.5
	b. water	2.5/**	6.2	***	7.5	18	5	6.8	8/5.9
	c. floodplain	2	2	2	2	2	2	2	2
9. Stream Pools a. percent		45	35	45	45	65	35	35	55
	b. category	DS/SS	DS/SS	DS/SS	DS/SS	DS/SS	DS/SS	SS/DS	SS/DS
10. Rearing Area		35	35	45	30	35	20	20	35
11. Debris Loading		18	12	25	5	12	4	4	17
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank a. Left		0	0	5	0	18	0	15	5
	b. Right	17	0	0	0	0	0	0	9
	b. indic Left	N	N	N	N	N	N	*	N
	Right	N	N	N	N	N	N	N	N
	c. veg Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank Left		U	GS	U	U	U	U	U	U
	Right	U	U	U	GS	U	U	U	U
17. Stab rating Left		1(1)	1(1)	1(1)	1(1)	3(2)	1(1)	2(2)	2(1)
	Right	2(1)	1(1)	1(1)	2(1)	3(2)	1(1)	1(1)	2(1)
18. Stream Canopy Cover		3	3	3	2	3	2	3	2
19. Fish Species CO		--	--	>30	>75	>12	<12	3	4
	Adult CS	>20	>30	>12	>12	>12	<12	<12	<6
	Adult PS	--	--	>30	>150	>25	>20	<6	--
	Adult/juv. DV	- / >30	- / >12						
	Adult/juv. SS	- / >12	- / >12						
20. Sampling		N	N	N	N	N	N	N	N

21. Comments \*Thin soil \*\*/3.15 \*\*\*3.5/1/1.5

Section 9: 69m; Small tributary converges on right with less than .5 cfs in a 2m wide channel; gravel/small cobble substrate, good rearing and approximately 1% ASA during higher flows.  
Heavy debris throughout section with large logs across the stream, especially in channel bends.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 10: 75m; Stream braiding within channel begins.

Stream Evaluation (Intertidal):

Excellent intertidal spawning substrate of primarily small cobble. Chum salmon were observed actively digging redds and "tailings" from other redds were readily visible. The ASA was diminished by flow and could be enhanced by increased riffle areas. Very little debris or rearing habitat in the intertidal area. Extensive tidal flat below the surveyed area where Big Creek is joined by Bridge Creek and Red Lake Outlet creek intertidal zones.

Section 11: 0-59m; Heavy debris loading causing braiding of channels and flow; signs of past beaver activity along banks.

Section 12: 74m; 6 to 8m wide stream channel converges on left with heavy blowdown and debris. Contains several large pools with no observed flow between (SS fry trapped in pools).  
97m; Side channel converges on right side of mainstream.  
Outstanding spawning area in cobble/gravel in this section.

Section 13: 36m; Recent beaver activity to dam the left half of mainstream.

Section 14: Active beaver sign observed; a small area of blowdown on the right upper bank.  
41-55m; Exposed bedrock and thin soil (<6" deep) along the right bank.

Section 15: 51m; A 10 to 12m channel converges on left with a small beaver dam 35m upstream. Less than .5 cfs flow over small cobble/gravel substrate below dam.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area A ADF&G Catalog No. 106-41-34

1. Section No.	17	18	19	20	21	22	23	24
2. Compass Bearing	249	173	178	164	150	204	140	190
3. Gradient	1.5	4	3	4	2.5	2	2.5	3
4. Temperature: Air	15	15.5	15.5	15.5	13	13	13	13
Water	11.5	11.5	11.5	11.5	11	11	11	11
5. Water qual: a. color	1	1	1	1	1	1	1	1
b. turbidity	1	1	1	1	1	1	1	1
c. pH	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
6. Streambottom Substrate	1 7	5	--	--	--	4	7	20
	2 30	40	30	30	20	35	30	33
	3 25	30	45	30	47	30	35	25
	4 22	20	20	20	25	20	20	17
	5 8	2	3	15	5	10	6	3
	6 --	--	--	--	--	--	--	--
	7 a) 8	b) 3	b) 2	b) 5	b) 3	b) 1	b) 2	b) 2
7. ASA a. percent	5	5	18	18	10	25	20	5
b. quality	1	1	1	1	1	1	1	1
8. Water Width a. channel	17	8.3	7	12	24	11.5	14	14.2
b. water	16.8	5	6.8	6.5	24	7	10.8	4.4
c. floodplain	1	2	1	2	2	2	2	3
9. Stream Pools a. percent	55	30	35	40	20	45	45	60
b. category	SS	DS	DS	DS/SS	DS	SS/DS	SS/DS	SE/DS
10. Rearing Area	30	20	25	25	15	25	25	40
11. Debris Loading	5	5	9	15	18	5	7	7
12. Potential Barriers	N	N	N	N	N	N	N	N
13. Enhancement/Rehab	N	N	N	N	N	N	N	N
14. Streambank Veg.	1-5	1-5	1-5	1,2,4	1,2,3	1-5	1-5	1-5
15. Upper Bank a. Left	0	0	0	17	0	29	32	0
b. Right	13	0	0	0	0	0	0	0
b. indic Left	N	*	N	N	N	N	**	***
Right	N	** ** *	N	N	N	N	N	N
c. veg Left	N	N	N	N	N	N	N	N
Right	N	N	N	N	N	N	N	N
16. Lower Bank Left	U	SS	U	GS	SS	U	GS	GS
Right	SS	SS	U	U	U	U	U	U
17. Stab rating Left	2(1)	1(1)	2(1)	1(2)	3(2)	3(1)	2(2)	1(2)
Right	1(1)	2(2)	1(1)	1(1)	2(1)	1(2)	1(1)	1(1)
18. Stream Canopy Cover	2	1	2	1	3	2	2	1
19. Fish Species Adult CS	--	<10	50+	>30	2	--	2	--
Juvenile SS	>12	>12	>12	>12	--	<6	<6	>12
Juvenile DV	--	--	>6	>10	2	>6	2	--
20. Sampling	Y	N	N	N	N	N	N	N

21. Comments \*6" Thin soil \*\*Steep slope; thin soil \*\*\*Thin soil \*\*\*\*6-8" Thin soil  
 Section 17: 87m; Main stem converges with Survey Area "B" on right side.  
 Section 20: 63m; Small channel converges on left.  
 74m; Beginning of extreme debris in channel causing extensive braiding and channelling of stream flow. Debris is primarily caused by blowdown; entire trees with root wads and standing trunks with twisted ends.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 20: 76m; Large debris jam across entire channel caused by right and left lower bank erosion/failure. Flow is under and over debris.

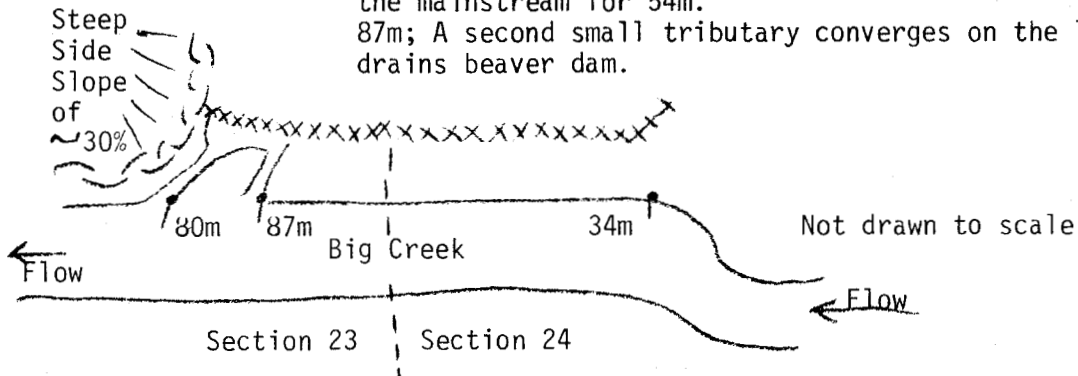
Stream Evaluation (Sections 5 through 19):

Excellent fish habitat throughout this reach. Numerous adult pink salmon, chum salmon and Dolly Varden were observed in riffles and pools. Riffle areas contain excellent ASA of clean, primarily small cobble (4-6") substrate over moderate stream gradients. Debris was generally moderate, though large pileups occurred at sharp bends in the channel. Deeply undercut banks (1-3' deep) and debris induced pools yield excellent cover for rearing fish along with dense riparian vegetation overhang from the lower banks. Side slopes were minimal, allowing extensive floodplains. Upper slopes appear stable though areas of thin soil ( $\leq 6"$  deep) were noted in some sections. Moderate to heavy erosion of the lower banks was observed.

Section 21: 72m; End of highly braided flow in the channel caused by debris and logs across stream and dense alder along banks.

Section 22: 22m; Minor lower bank failure on left lower bank and a 4m wide by 5m long exposed clay deposit.

Section 23: 80m; Small tributary (less than 1 cfs flow and heavy rust bacterium) converges on the left. 19m up tributary is the lower end of a 4' high beaver dam, which parallels the left bank of the mainstream for 54m.  
87m; A second small tributary converges on the left which also drains beaver dam.



Section 24: 34m; End of beaver dam paralleling left stream edge.  
60-68m; Survey Area "B" channel opening diverges from main stem (Survey Area "A"). Heavy debris in channel opening.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area A ADF&G Catalog No. 106-41-34

1. Section No.		25	26	27	28	29	30	31	32
2. Compass Bearing		126	172	155	148	221	212	190	135
3. Gradient		2.5	3	2.5	3	3	2.5	3	3
4. Temperature: Air		13	13	13	13	14	14	14	14
	Water	11	11	11	11	11.5	11.5	11.5	11.5
5. Water qual:	a. color	1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
6. Streambottom Substrate	1	17	8	8	18	15	20	25	40
	2	25	45	33	30	25	37	30	30
	3	30	25	25	25	40	25	20	20
	4	20	15	20	15	14	15	10	9
	5	7	5	8	7	5	3	3	1
	6								
	7	b <sub>1</sub>	b <sub>2</sub>	a <sub>4</sub> b <sub>2</sub>	a <sub>5</sub>	b <sub>1</sub>	--	a <sub>10</sub> b <sub>2</sub>	--
7. ASA	a. percent	10	--	10	7	5	5	--	--
	b. quality	2	--	1	2	2	2	--	--
8. Water Width	a. channel	21	29	25	13	6	16	13	16.5
	b. water	2/5.5	12	4.1/3.2	13	4.4	9	7.5	4.9
	c. floodplain	2	2	3	3	3	3	3	2
9. Stream Pools	a. percent	70	55	60	40	60	25	40	20
	b. category	SS/DS	DS/SF	SF/DS	DS	SS	SF/DF	DS/SF	SS/SF
10. Rearing Area		35	25	35	30	30	25	30	10
11. Debris Loading		8	12	9	10	9	7	7	1
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank	a. Left	0	0	18	46	43	0	0	0
	b. Right	12	10	9	0	0	18	19	29
	b. indic								
	Left	N	N	N	V-not	V-not	*	*	*
	Right	N	N	N	N	*	*	*	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	U	U	U	GS	U	U	U	GS
	Right	U	GS	SS	SS	GS	GS	U	U
17. Stab rating	Left	1(2)	2(1)	1(1)	1(3)	2(1)	2(2)	2(1)	1(2)
	Right	2(1)	1(2)	3(2)	2(1)	2(2)	2(2)	3(2)	2(2)
18. Stream Canopy Cover		1	3	3	2	2	3	2	2
19. Fish Species	Adult	CS	3	>6	1	--	--	1	2
	Juvenile	SS	>6	>6	>12	>25	>12	>12	>6
	Adult	DV	>6	>6	--	--	--	--	--
20. Sampling		N	N	N	N	N	N	N	N

21. Comments \*Thin soil

Section 25: 0m; Small side channel converges on the left, approximately 25m long.

Section 26: 67m; Side channel converges on right. A tributary joins the right side channel at 35m which drains a beaver impoundment at 15m. The dam/pond parallels the right bank of the side channel.

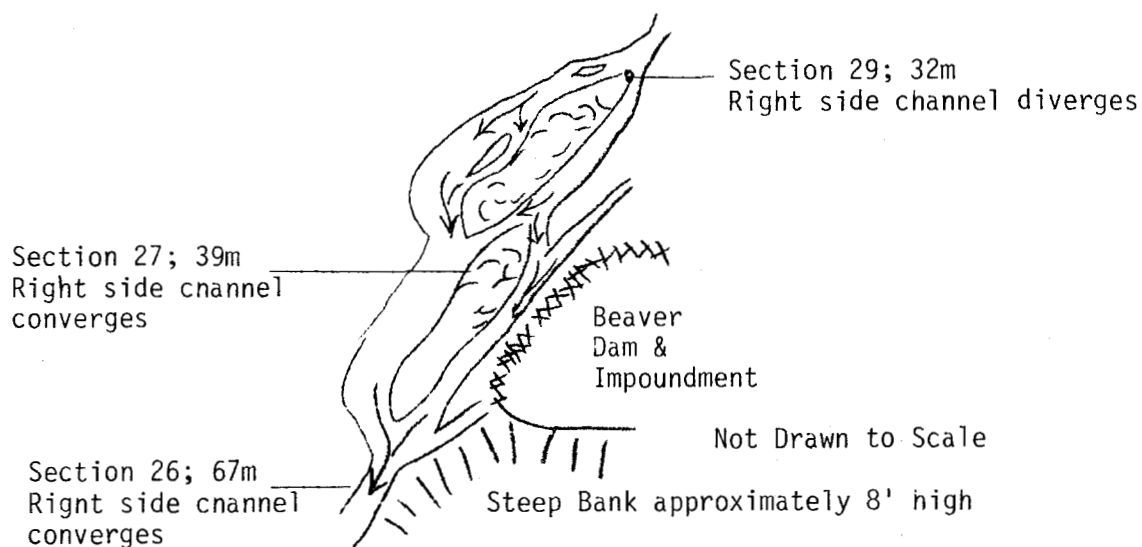
LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 26, 67m to 29, 32m: Highly disturbed area with channel braiding;  
dense alder growth.

Section 28: 81.5m; Small tributary on left flagged blue/white by USFS;  
less than .5 cfs flow; small cobble/gravel substrate.

Section 29: 69m; Tributary with less than 1 cfs flow converges on left;  
flagged blue/white by the USFS.



Section 32: 13.5m; A small tributary converges on left after cascading over  
a small cobble/gravel substrate at 5 to 7% gradient down a  
hillside.  
43.5m; An 8m wide channel converges on right.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area A ADF&G Catalog No. 106-41-34

1. Section No.		33	34	35	36	37	38	39	40
2. Compass Bearing		170	150	145	108	139	129	141	131
3. Gradient		2.5	3	2.5	3	6	2.5	3	3
4. Temperature: Air		14	14	14	13.5	13	13	13	13
	Water	11.5	11.5	11.5	11.5	11	11	11	11
5. Water qual:	a. color	1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	7.5	7.5	7.3	7.3	7.3	7.3	7.3	7.3
6. Streambottom Substrate	1	25	30	20	22	15	20	25	20
	2	30	30	35	35	20	30	25	23
	3	29	20	30	30	35	25	32	30
	4	9	9	14	10	20	15	15	20
	5	1	1	1	1	7	3	1	7
	6								
	7	a) 5 b) 1	a) 10	--	a) 2	b) 3	a) 7	a) 2	--
7. ASA	a. percent	--	3	--	3	5	2	--	--
	b. quality	--	2	--	2	2	2	--	--
8. Water Width	a. channel	14.5	14	31.3	14	23	18	16.5	13.2
	b. water	4.3	7.6	14.5	7	13	16	8.2	10
	c. floodplain	2	2	1	2	2	2	3	2
9. Stream Pools	a. percent	70	25	60	50	70	45	60	75
	b. category	DS	SS/SF	SS/DS	SS/SF	DS/SS	DS/SS	DS/SF	DS
10. Rearing Area		35	15	20	20	35	20	15	20
11. Debris Loading		5	1	5	4	20	1	3	9
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank	a. Left	34	29	11	32	18	13	0	0
	b. Right	11	20	20	20	0	0	0	0
	b. indic								
	Left	N	*	N	N	N	N	N	N
	Right	N	N	**	N	N	N	N	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	U	U	U	U	SS	U	GS	U
	Right	SS	GS	U	GS	U	U	GS	GS
17. Stab rating	Left	2(2)	2(1)	2(1)	1(1)	2(1)	1(3)	1(2)	2(2)
	Right	2(2)	1(2)	3(2)	2(2)	2(1)	2(2)	1(2)	1(2)
18. Stream Canopy Cover		1	3	2	3	3	2	2	2
19. Fish Species	Adult CS	--	--	--	3	2	--	--	--
	Juvenile SS	>6	<25	>12	>12	>12	>6	>6	>12
	Adult DV	--	--	--	--	--	--	--	--
	Juvenile CT	<6	--	1	--	>6	--	--	--
	Juvenile DV	--	>6	--	--	--	--	--	--
20. Sampling		N	N	Y	N	Y	N	N	N

## 21. Comments

Section 33: 50m; Channel diverges on right under heavy debris.  
 Section 34: 28.5m; 2m wide dry channel of 75% boulders/large cobble converges on right (8-10% gradient).  
 95m; Side channel converges with approximately 1.5 cfs flow in a 4m wide channel.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

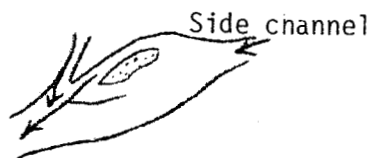
## 21. Comments Cont.

Section 35: 10-32m; Right bank failure 22m long by about 3m high; and several "leaning" trees which will be in the channel soon. Failure is due to the undermining of the banks by the stream and to a thin soil layer over large cobble/boulders.  
73m; Side channel diverges.  
98m; A 7m wide channel converges on right with gravel/small cobble substrate.

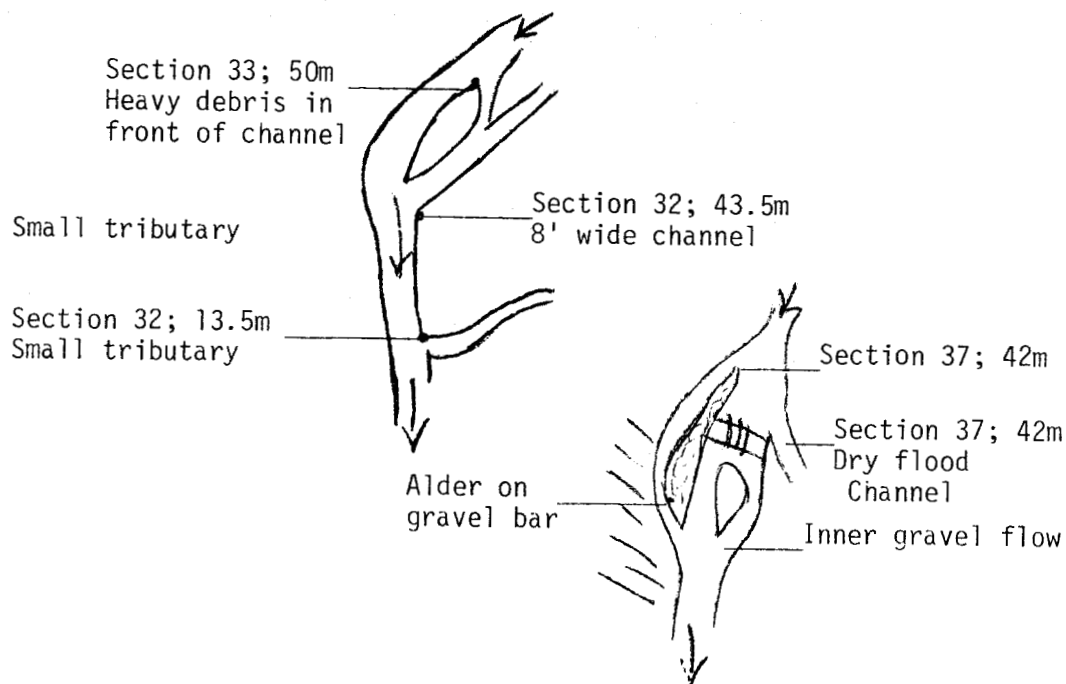
Section 36: 94m; Beginning of channel braiding caused by debris in the channel. Flood channel on left side.

Section 37: 42m; Dry channel diverges on right.

Section 40: 46m; Tributary converges on left.



Not Drawn to Scale





# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area A ADF&G Catalog No. 106-41-34

1. Section No.	41							
2. Compass Bearing	133							
3. Gradient	3							
4. Temperature: Air	13							
Water	11							
5. Water qual: a. color	1							
b. turbidity	1							
c. pH	7.3							
6. Streambottom Substrate	1 25							
	2 30							
	3 30							
	4 10							
	5 2							
	6 --							
	7 d3							
7. ASA a. percent	3							
b. quality	2							
8. Water Width a. channel	23							
b. water	12							
c. floodplain	1							
9. Stream Pools a. percent	50							
b. category	SF/DS							
10. Rearing Area	25							
11. Debris Loading	6							
12. Potential Barriers	N							
13. Enhancement/Rehab	N							
14. Streambank Veg.	1-3,5							
15. Upper Bank a. Left	0							
b. Right	0							
b. indic Left	N							
Right	N							
c. veg Left	N							
Right	N							
16. Lower Bank Left	U							
Right	SS							
17. Stab rating Left	2(2)							
Right	3(2)							
18. Stream Canopy Cover	3							
19. Fish Species Adult CS	--							
Juvenile SS	<25							
Adult DV	--							
Juvenile CT	1							
Juvenile DV	--							
20. Sampling								
21. Comments								

Section 41: 0m; Lower bank/root wad failure into stream 5m wide by 3m high.  
43m; Tributary converges on right with a 2.5m wide channel.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area B ADF&G Catalog No. 106-41-34

1. Section No.		1	2	3	4	5	6	7	8
2. Compass Bearing		241	134	218	177	174	156	167	141
3. Gradient		2.5	2.5	3	2	1.5	2	2.5	2
4. Temperature: Air		13	13	13	13	13	13	13	13
Water		11	11	11	11	11	11	11	11
5. Water qual: a. color		1	1	1	1	1	1	1	1
b. turbidity		1	1	1	1	1	1	1	1
c. pH		7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
6. Streambottom Substrate	1	10	--	10	--	--	--	--	--
	2	25	30	30	20	30	22	15	15
	3	20	45	35	43	40	40	50	45
	4	20	15	15	30	20	25	30	30
	5	10	8	5	5	7	10	3	8
	6	--	--	--	--	--	--	--	--
	7	*	b) 2	b) 5	b) 2	b) 3	b) 3	b) 2	b) 2
7. ASA a. percent		10	10	--	15	10	2	7	2
b. quality		1	1	--	2	2	2	2	2
8. Water Width a. channel		15	5	14.9	14.5	10.9	8	14.8	13.6
b. water		3.25	3.2	4.4	5.2	3.7	7	2.8	3.15
c. floodplain		2	2	2	2	2	2	2	2
9. Stream Pools a. percent		55	40	75	45	60	70	50	40
b. category		SS	SS/DS	DS/SS	SS	SS	SS	DS/SS	SS/DS
10. Rearing Area		40	35	60	35	30	45	35	25
11. Debris Loading		12	7	18	9	9	12	15	9
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank a. Left		0	0	0	0	0	0	0	0
b. Right		14	10 est	8	4	5	0	0	0
b. indic Left		N	N	N	N	N	N	N	N
Right		N	N	N	N	N	N	N	N
c. veg Left		N	N	N	N	N	N	N	N
Right		N	N	N	N	N	N	N	N
16. Lower Bank Left		U	U	GS	GS	U	GS	U	GS
Right		U	SS	GS	GS	SS	U	GS	U
17. Stab rating Left		2(1)	2(1)	1(2)	1(2)	1(2)	2(2)	1(1)	1(2)
Right		2(1)	1(2)	2(2)	1(1)	2(2)	2(1)	1(2)	2(1)
18. Stream Canopy Cover		3	3	1	3	3	1	2	2
19. Fish Species	SS	>25	>25	>25	>25	>12	<12	>25	>25
juveniles	CT	1	--	--	--	--	--	--	--
	DV	--	1	--	--	--	--	--	--
	CO	--	1	--	--	--	--	--	--
20. Sampling		N	N	N	N	N	N	N	N
21. Comments	*a) 10 b) 3 c) 2								

Section 1: 0m; Survey Area B began where it converges with the mainstream. Flow is 4 to 5 cfs (est).  
49m; Small side channel on right; characterized by gravel riffles and copious debris.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 10% ASA is large cobble substrate and would be available to SS or CS. Heavy blowdown over the mainflow in first 15m.

Section 3: Contained cobble riffles, debris, and recent beaver damming activity. Many pools due to debris and beaver activity; few riffles of larger cobble substrate, therefore good rearing and minimal spawning areas. No CS seen, however, coho fry were abundant.

Section 8: 93m; Channel diverges from Survey Area "A" (main stem) at Section 24, 60m.

Stream Evaluation (Survey Area "B")

Survey Area "B" is a side channel of the mainstream, Survey Area "A" (diverging at Section 24, 60m, and converging on the right at Section 17; 87m). It is an overall good coho spawning and rearing area. Localized ASA in primarily small cobble substrate with varying amounts of large cobble. ASA quality was more compact and not as clean as in the mainstream. Intermittent heavy debris loading caused extensive stream braiding and induced pooling. Frequent signs of beaver activity, including small, recent dams, increased silt in stream substrate and provided some excellent rearing habitat. Coho fry were abundant in debris induced pools and beaver impoundments.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek Survey Area "C" ADF&G Catalog No. 106-41-34

1. Section No.		1	2	3	4				
2. Compass Bearing		133	161	124	119				
3. Gradient		3	1.5	1.5	8				
4. Temperature: Air		11	11	11	11.5				
Water		9.5	9.5	9.5	9.5				
5. Water qual: a. color		1	1	1	1				
b. turbidity		1	1	1	1				
c. pH		7	7	7	7				
6. Streambottom Substrate	1	10	20	15	10				
	2	20	20	20	15				
	3	25	25	35	30				
	4	15	10	15	25				
	5	5	5	5	5				
	6								
	7	a) 25	a) 20	*	a) 12 b) 3				
7. ASA a. percent		1	3	10	5				
b. quality		3	2	2	2				
8. Water Width a. channel		17	14.5	15	8.4				
b. water		12	12	2.3	4.2				
c. floodplain		1	2	2	3				
9. Stream Pools a. percent		35	75	45	25				
b. category		DS/SS	DS/SS	SS	DS/SS				
10. Rearing Area		5	60	40	15				
11. Debris Loading		10	7	20	10				
12. Potential Barriers		N	N	N	N				
13. Enhancement/Rehab		N	N	N	N				
14. Streambank Veg.		1-5	1-5	1-5	1-5				
15. Upper Bank a. Left		14	17	20	0				
b. Right		11	15	6	5				
b. indic Left		N	N	N	N				
Right		N	N	N	N				
c. veg Left		N	N	N	N				
Right		N	N	N	N				
16. Lower Bank Left		U	U	GS	GS				
Right		SS	U	U	U				
17. Stab rating Left		2(1)	2(1)	1(2)	1(2)				
Right		1(1)	2(1)	3(1)	2(1)				
18. Stream Canopy Cover		3	2	3	1				
19. Fish Species Juvenile SS		3	>12	>6	<6				
20. Sampling		N	Y	Y	N				
21. Comments *a) 3b) 5c) 2									

Section 1: 0m; Survey begun \_\_\_\_\_ m above foot Survey Area "A"; this is a continuation of main stem survey using helicopter. Poor rearing area due to lack of cover; substrate is generally too large for spawning purposes.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 0m; Tributary converges on the left with less than 1 cfs flow and riparian vegetation in the stream channel. Possible rearing area.

46m; A tributary/side channel converges on right with about 2.5 cfs flow (9°C water temperature; 7.0 pH) over a gravel/small cobble substrate. Excellent rearing area and some ASA.

54m; Side channel converges on right with about 1.5 cfs flow. Excellent rearing in DS pools, undercut banks, and root wads. Little ASA due to 4-7" size substrate.

Section 3: 45m; A large (+30m wide) gravel/cobble channel converges on the right under heavy log debris. No flow observed at time of survey; mature alder are growing in the gravel channel. Substrate size decreased (3-4" cobble) resulting in greater ASA. Excellent pool/debris rearing area.

Section 4: 45m; Dry stream channel converges on right. Good ASA and pool rearing area in first 50m; but very little in second 50m.

75m; Cascade/falls over bedrock and increasing gradients.

Stream Evaluation (Survey Area "C")

The survey area had moderate to steep gradients, cascades and riffles between pools and moderate debris loading. Good ASA was found in Sections 3 and 4 in 2-4" gravel/small cobble, though substrate was generally larger (4-7") decreasing the estimate. Rearing habitat was good to excellent in large DS pools, depending on amount of available cover. In Section 2, two moderate sized tributaries/side channels converged on right with main stem, nearly doubling the total flow of the mainstream. Both channels exhibited good ASA and rearing habitat. In Section 3, a large dry channel converges with a main stem characterized by steep bedrock cascades/falls contained within a narrow channel.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek - Survey Area D ADF&G Catalog No. 106-41-34

1. Section No.	1	2	3				
2. Compass Bearing	164	136	183				
3. Gradient	4	7	7 est				
4. Temperature: Air	8.5	8.5	8.5				
Water	8	8	8				
5. Water qual: a. color	1	1	1				
b. turbidity	1	1	1				
c. pH	7.5	7.5	7.5				
6. Streambottom Substrate	1	25	20	15			
	2	20	15	15			
	3	15	15	10			
	4	5	5	5			
	5	--	--	--			
	6	--	--	--			
	7	35	45	55			
7. ASA a. percent	--	--	--				
b. quality	--	--	--				
8. Water Width a. channel	7.5	9.0	8.5				
b. water	4	4.5	4.5				
c. floodplain	2	2	2				
9. Stream Pools a. percent	35	30	25				
b. category	SS/SF	DS/SF	SF/SS				
10. Rearing Area	20	20	10				
11. Debris Loading	--	4	2				
12. Potential Barriers	N	N	N				
13. Enhancement/Rehab	N	N	N				
14. Streambank Veg.	1-5	1-5	1-5				
15. Upper Bank a. Left	30	65	106				
b. Right	37	65	58				
b. indic Left	N	V-not	V-not				
Right	N	V-not	V-not				
c. veg Left	N	Y	Y				
Right	Y	Y	Y				
16. Lower Bank Left	GS	SS	SS				
Right	SS	SS	GS				
17. Stab rating Left	1(1)	1(1)	1(1)				
Right	2(1)	2(1)	1(1)				
18. Stream Canopy Cover	2	1	3				
19. Fish Species juvenile CT	2	--	--				
20. Sampling	Y	Y	N				
21. Comments							

Section 1: Two muskeg runoff channels enter on left with less than 1 cfs flow.  
 Section 3: Extremely unstable V-notch with heavy sliding activity was apparent. Tributary converges on left with about 3 cfs flow, (about 20% of total flow of main stem), about 10% gradient, 7.5 pH, 9°C water temperature, and flows through steep V-notch over a boulder/cobble substrate.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 3: 100+18m; Barrier falls - 3.0 vertical meter waterfall over a 15% gradient rise over 18m.

Stream Evaluation

This section of stream is characterized by steep gradients, V-notch and 100% bedrock/cobble substrate. Three cutthroat were observed. No spawning and minimal rearing area.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Big Creek - Survey Area EADF&G Catalog No. 106-41-34

1. Section No.		1	2	3	4	5			
2. Compass Bearing		221	245	228	250	223			
3. Gradient		4	5	5	7	13			
4. Temperature: Air		8°	--	--	10°	--			
Water		7	--	--	7.5	--			
5. Water qual: a. color		1	1	1	1	1			
b. turbidity		1	1	1	1	1			
c. pH		7.7	--	--	7.7	--			
6. Streambottom Substrate	1	13	10	5	4	--			
	2	30	5	5	2	--			
	3	20	3	--	2	--			
	4	5	1	--	2	--			
	5	2	1	--	--	--			
	6	--	--	--	--	--			
	7	a)30	a)80	a)90	a)90	a)100			
7. ASA a. percent		0	0	0	0	0			
b. quality		0	0	0	0	0			
8. Water Width a. channel		8.6	8.6	5.9	4.3	2.92			
b. water		2.8/5	2.95	0.8	3.4	1.0			
c. floodplain		1	1	1	1	1			
9. Stream Pools a. percent		30	30	20	28	50			
b. category		SF	DS	DS	SF	SF			
10. Rearing Area		35	10	35	33	30			
11. Debris Loading		2	0	0	0	0			
12. Potential Barriers		N	Y	N	N	Y			
13. Enhancement/Rehab		N	N	N	N	N			
14. Streambank Veg.		1-3,5	1-5	1,3,5	1,3,5	1,3,5			
15. Upper Bank a. Left		15	27	150	57	120			
b. Right		16	16	50	85	36			
b. indic Left		N	N	N	N	N			
Right		N	N	N	N	N			
c. veg Left		N	N	N	N	N			
Right		N	N	N	N	N			
16. Lower Bank Left		SS	U	SS	U	SS			
Right		U	U	SS	SS	GS			
17. Stab rating Left		1(2)	1(2)	1(3)	1(3)	1(3)			
Right		2(2)	2(1)	1(3)	1(3)	1(3)			
18. Stream Canopy Cover		3	3	2	2	2			
19. Fish Species		0	0	0	0	0			
20. Sampling		Y	N	Y	N	N			

21. Comments

Section 1: Stream flow estimated at 5 cfs. Approximately 50m beyond the left bank, an extensive muskeg is visible.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 7m; A 2.0m high cascade over bedrock represents a potential high flow/velocity barrier.  
50m; Enter V-notch, substrate primarily bedrock.

Section 3: 2.0m high bedrock cascade.  
82m; A tributary providing approximately 20% of the flow enters the main stem via the left bank and a barrier/cascade falls. Water temperature, 7.0°C; pH, 7.7.

Section 4: Continuous V-notch with increasing gradient/decreasing flow.

Section 5: Survey end at base of 3m falls, 27.5m.

# FISH SAMPLING FORM

Stream Name Big Creek ADF&G Catalog No. 106-41-34 Date 8/29/82  
 Identify Survey Area A Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1215	1708	2 - SS	85, 75mm	Section #8 under debris.
2	1430	1655	4 - SS	80, 100, 85, 98mm	Section #15; 0m in 4 foot deep pool among debris.
			17 - CO	--	
			1 - DV		
3	1455	1645	2 - SS	45, 47mm	Section #17

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## FISH SAMPLING FORM

Stream Name Big Creek ADF&G Catalog No. 106-41-34 Date 8/30/82

Identify Survey Area A Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1535	1755	1 CT 10 SS	97 74, 97, 87, 40, 43, 51, 57, 45, 50, 42mm	Section 35; 14m.
2	1620	1740	2 CT 5 SS	90, 90, 82, 47, 47mm	Section 37; 25m.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# FISH SAMPLING FORM

Stream Name Big Creek ADF&G Catalog No. 106-41-34 Date 9/28/82

Identify Survey Area C Water Temp. 9.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1400	1510	3 - SS	91mm 89mm 93mm	Section 2; 29m In DS pool under a root wad.
2	1420	1500	1 - CT	--	Section 3, 45mm DS pool under debris
			7 - SS	41, 59, 40, 71, 69, 55, 54mm	

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## FISH SAMPLING FORM

Stream Name Big Creek ADF&G Catalog No. 106-41-34 Date 9/28/82

Identify Survey Area D Water Temp. 8.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1356	1504	0	--	Section 1: Bedrock/cobble pool in center of stream.
2	1409	1445	1 - CT	--	Section 2: Bedrock/cobble pool in center of stream.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# FISH SAMPLING FORM

Stream Name Big Creek ADF&G Catalog No. 106-41-34 Date 9/28/82

Identify Survey Area E Water Temp. 7°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1315	1500	0	--	Section 1: 0m; midstream log.
2	1415	1455	0	--	Section 3; 36m; right side bank.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# PEAK ESCAPEMENT RECORD

Big Creek

106-41-34

DATE	PINK	CHUM	OTHER SPECIES	REMARKS
7/12/60	--	--	720 RS	
9/02/60	500	200/36		
1961	--	--		
9/13/70	10	0		
1971	Surveyed	None Seen		
8/11/75	30	0		
8/26/75	0	100/35		
7/26/77	3	0		
8/22/78	180	0		
8/08/79	20	0		
8/26/80	900	0		

# FIELD NOTE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A, B
2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Bridge Creek
2. ADF&G Catalog No. 106-41-33
3. Lat. 56°15'50"
3. Long. 133°20'20"
4. Agency Unit 05
5. Mgmt Area 533 K
6. DSGS Map No. Petersburg B-5
7. Aerial Photo No. 71-17-9-26, 27
8. Bay/Drainage Red Bay
9. Access 2
10. Camping 4
11. Present Land Use a. Bridge crossing 11b. heavy brush interference
12. Historical Land Use 1970's logging unit along right bank from mouth of stream to #5600 road bridge crossing.
13. Stream Origin 3 5 6
14. Flow Stage 2
15. Flow Em, 3.7m, 0.08m, 6.6m, 0.8, 16:39<sup>sec</sup> -- 0.095m<sup>3</sup>/sec  
method width depth length constant time grid flow  
3.4 cfs
16. Temp. Sensitivity Lack of canopy due to logging activities
17. Beaver 5
18. Type aquatic Veg. 2
19. Density Aquatic Veg. 1
20. Adult Salmon Y
21. Intertidal a. gradient 2%
- b. bottom type % fines 13% c. ASA 15%
- gravel small cobble 60% d. schooling Y
- large cobble/boulders/bedrock 27% e. shellfish N
- f. No nearby anchorage; must anchor at edge of tide flats along right or left shoreline and walk to stream mouth.
22. Comments  
20. 3 chum salmon carcasses observed.  
21c. Excellent pink and coho spawning area of gravel/small cobble substrate.  
21d. Schooling in the intertidal areas of Big Creek where large pools exist.

Stream was flagged blue/white from mouth to barrier falls.

23. Investigators Murph/Mickowski
24. Date 9/15/82
25. Time 1100 1330
- Area A Surveyed 9/14/82 start 1520 end 1830
26. Weather 3
27. Photos 3

R-10 2600-3a (1/81)



Bridge Creek  
106-41-33

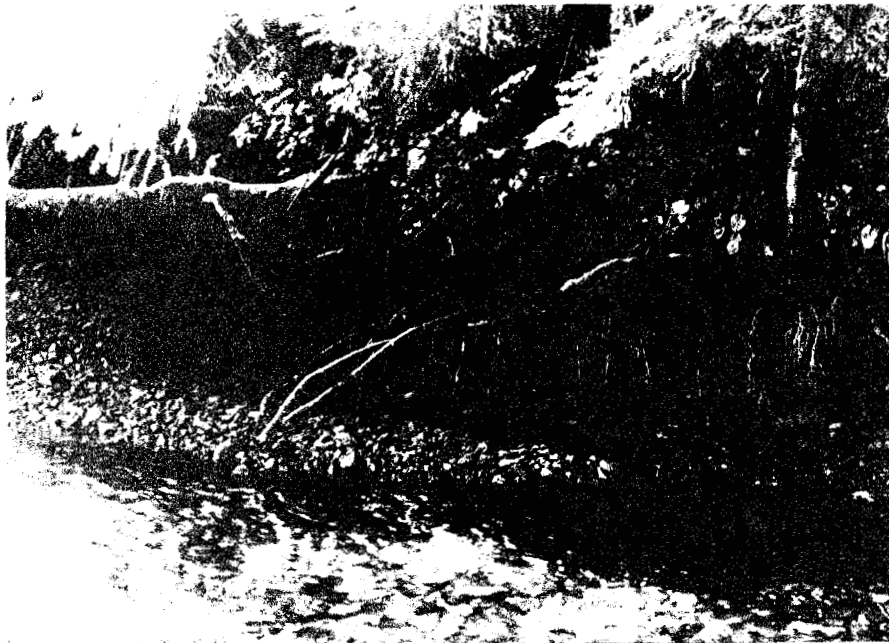


1. Downstream View of Lower ITZ and Confluence with ITZ of Big Creek Looking Toward Red Bay.

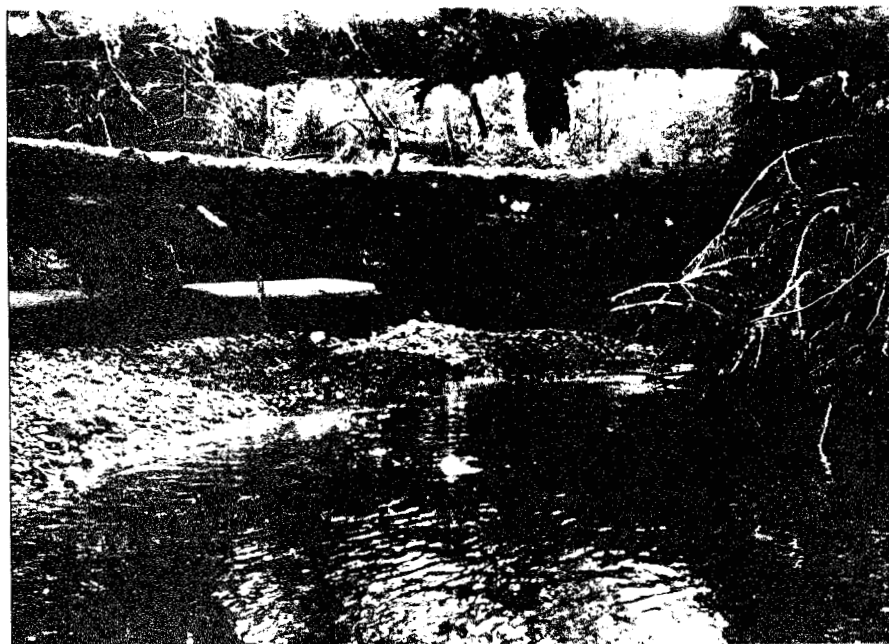


2. Upper ITZ and Mouth With Windthrown Buffer Strip, Right Side.

Bridge Creek  
106-41-33



3. Undercut Bank in Section 3 With Considerable Root Exposure.

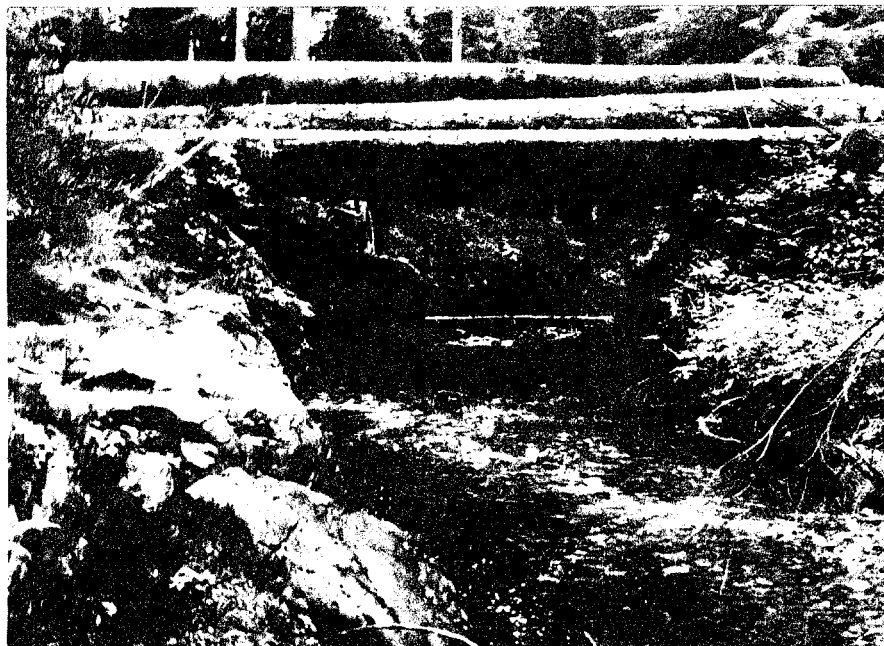


4. Heavy Blowdown and Channel Migration in Section 1. Original Channel is on Left Side.

Bridge Creek  
106-41-33



5. Section 2: Heavy Instream Debris with Windthrow.

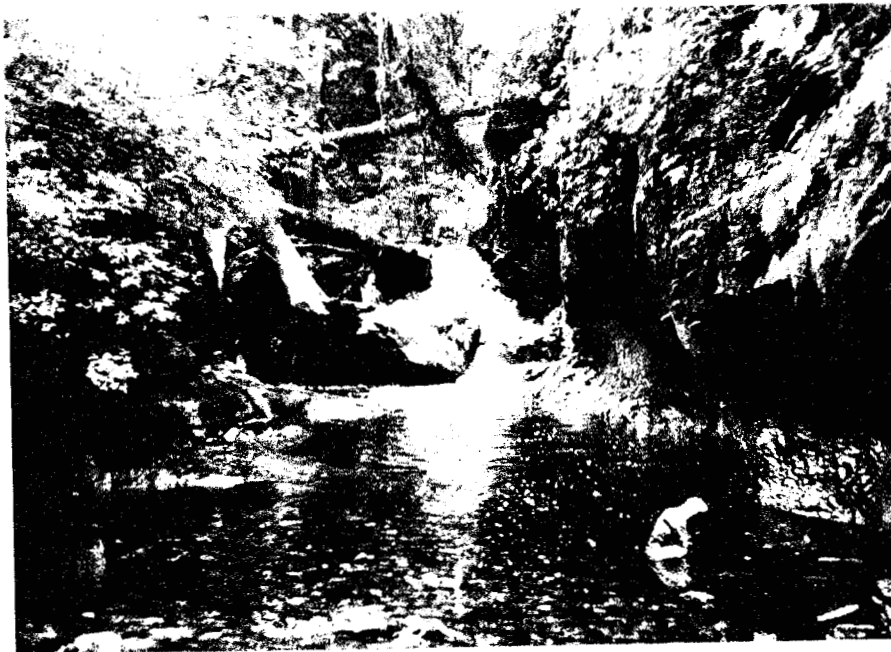


6. Log Stringer Bridge Crossing With Bedrock Banks,  
Section 9: 56 m.

Bridge Creek  
106-41-33



7. V-notch Habitat Above Bridge and Below Falls,  
Section 10: 0m.



8. A 4.0 Meter Barrier Falls With Undercut Bedrock  
Bank, Right Side, Indicating Potential for High  
Velocity Flows, Section 10: 100 m.

Bridge Creek  
106-41-33

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Area A					Area B				
11	100	3.4	15	51	1	100	2.0	3	6
2	100	4.3	10	43	2	100	1.1	2	<u>2.2</u>
3	100	9.2	15	138	Total				8.2m <sup>2</sup>
4	100	14.2	15	213					
5	100	5.3	10	53					
6	100	3.3	3	9.9					
7	100	6.2	3	18.6					
8	100	5.0	15	75					
9	100	4.4	15	66					
11	100	5.8	3	17.4					
13	100	3.7	2	<u>7.4</u>					
Total				692.3m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bridge Creek

ADF&G Catalog No. 106-41-33

Survey Area "A" (main stem)

1. Section No.		11	2	3	4	5	6	7	8
2. Compass Bearing		107	91	130	126	81	124	103	116
3. Gradient		2	2	2	2	2.5	3	5	4
4. Temperature: Air		14	14	14	14	13	13	13	13
	Water	10	10	10	10	10	10	10	10
5. Water qual:	a. color	1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	--	7.5	7.5	7.5	7.5	7.5	7.5	7.5
6. Streambottom	Substrate	1	5	5	6	5	5	--	2
		2	20	12	15	15	20	20	10
		3	40	45	45	50	50	57	55
		4	20	20	25	20	20	15	25
		5	13	9	7	3	3	5	5
		6	--	--	--	--	--	--	--
		7	b) 2	a) 6 b) 3	b) 2	a) 4 b) 3	b) 2	b) 3	a) 1 b) 2
7. ASA	a. percent	15	10	15	15	10	3	3	15
	b. quality	1	1	1	1	1	1	1	1
8. Water Width	a. channel	9.6	14.3	10	14.2	9.6	6.7	12.	8.7
	b. water	3.4	4.3	9.2	14.2	5.3	3.3	6.2	5.0
	c. floodplain	2	1	1	1	2	2	3	3
9. Stream Pools	a. percent	25	30	20	20	20	20	25	20
	b. category	SS	SS/DS	SS/DS	SS	SS	SS	SS	SS/DS
10. Rearing Area		30	35	25	25	25	25	30	25
11. Debris Loading		12	25	9	15	15	20	18	12
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		5	1-3,5	1-3,5	1-3,5	1-3,5	1-3,5	1-3,5	1-3,5
15. Upper Bank	a. Left	2	15	5	11	6	0	5	5
	b. Right	0	32	0	22	25	4	5	10
	b. indic								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	GS	U	U	U	GS	U	U	GS
	Right	U	GS	GS	U	U	SS	U	GS
17. Stab rating	Left	1(2)	1(2)	2(1)	1(1)	1(1)	2(1)	2(1)	2(2)
	Right	2(2)	2(2)	1(1)	1(1)	2(1)	1(1)	2(1)	2(2)
18. Stream Canopy Cover		3	3	3	2	3	3	3	3
19. Fish Species	juvenile SS	--	--	1	>6	--	--	--	--
	" CT	--	2	1	>6	--	--	--	--
	adult CS	2mort	--	1mort	--	--	--	--	--
20. Sampling		N	N	N	Y	Y	N	N	N
21. Comments	<p>Section 11: 0m; Confluence with Big Creek (intertidal zone) at grass line on 106-41-34's left bank.  3m; Treeline on right side (small group of trees). Beginning of clearcut along right bank.  90m; End of intertidal zone.</p>								

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 0-30m; Copious debris.  
100m; Passable debris dam.

Section 3: 60-100m; Moderate blowdown along left bank.  
98m; Sunken logs and piled up debris create .3-.5m "cascade",  
excellent rearing pool beneath.

Section 4: 19-41m; Channel braiding induced by buffer blowdown.

Section 5: 32m; Side channel converges with main stem via the left bank  
(see Area "B"), less than 3.0 cfs.  
32-100m; Heavy blowdown and logging debris.

Section 6: Narrow buffer strip extends from Section 7: 44m through  
Section 6; heavy blowdown throughout.

Section 7: 44m; Side channel diverges from main stem via left bank  
(see Area "B").  
44-78m; Heavy log debris from clearcut along right bank.

Section 8: 32m; Side channel diverges, left.  
68m; Debris dam, inducing channel braiding.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bridge Creek

ADF&G Catalog No. 106-41-33

Survey Area "A" (Main Stem)

1. Section No.		9	10	11	12	13			
2. Compass Bearing		99	74	121	149	171			
3. Gradient		3	10	4	5	10			
4. Temperature: Air		13	13	13	13	13			
	Water	10	10	10	10	10			
5. Water qual:	a. color	1	1	1	1	1			
	b. turbidity	1	1	1	1	1			
	c. pH	7.5	7.5	7.5	7.5	7.5			
6. Streambottom Substrate	1	10	15	35	35	30			
	2	30	20	20	20	25			
	3	40	22	30	25	25			
	4	15	15	6	8	10			
	5	--	--	--	--	--			
	6	--	--	--	--	--			
	7	a) 5	a) 25 b) 3	a) 8 b) 1	a) 12	a) 7 b) 3			
7. ASA	a. percent	15	--	3	--	2			
	b. quality	1	--	1	--	1			
8. Water Width	a. channel	7	7.5	6.0	5.1	6.8			
	b. water	4.4	3.2	5.8	3.6	3.7			
	c. floodplain	2	1	1	1	1			
9. Stream Pools	a. percent	25	30	15	10	15			
	b. category	SS/DS	SS/DS	DS/SF	SF	SF/DF			
10. Rearing Area		25	30	15	10	10			
11. Debris Loading		2	7	5	2	15			
12. Potential Barriers		N	Y	N	N	Y			
13. Enhancement/Rehab		N	N	N	N	N			
14. Streambank Veg.		1,3,5	1,3,5	1,3,5	1-3,5	1,3,5			
15. Upper Bank	a. Left	5	84	19	34	80			
	b. Right	30	45	33	15	62			
	b. indic								
	Left	N	V-not	N	N	V-not			
	Right	N	N	N	N	N			
	c. veg								
	Left	N	V-not	N	N	V-not			
	Right	N	N	N	N	N			
16. Lower Bank	Left	SS	SS	SS	SS	SS			
	Right	GS	SS	SS	GS	SS			
17. Stab rating	Left	1(2)	1(3)	1(3)	1(3)	1(3)			
	Right	1(2)	1(3)	1(3)	2(2)	1(3)			
18. Stream Canopy Cover		3	2	3	3	2			
19. Fish Species	juv.	SS	--	--	0	0			
	"	CT	--	--					
	adult	DS	--	--					
20. Sampling		N	N	Y	N	N			
21. Comments	Section 9: 56m; End of clearcut on right bank. 56-66m; #5600 (#1000) road bridge crossing (log stringer bridge); ASA is 4-7" cobble.								



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 10: 100m; Barrier falls; 4.0 meter vertical drop over bedrock; steep sided V-notch of bedrock.

Section 11: 4% stream gradient; pools and cobble/boulder riffles immediately above falls.

Section 12: 50-100m; V-notch with exposed bedrock walls.

Section 13: Stream cut V-notch throughout section.  
36m; "Notched debris dam falls", drop 1.5 vertical meters onto boulders, no pool beneath.  
50m; Debris barrier; majority of flow funnels through a 3.0m wide bedrock/boulder chute along right side of jam, no pool beneath.  
100m; Notch depth, 7.0-8.0m of vertical bedrock; channel width, 4.0m. Survey end.

V-notch culminates at a 3.0m high, high velocity falls/chute, 35.0m beyond survey end.

Stream Evaluation:

The clearcut which extends from stream mouth to bridge crossing (Section 9) has induced, extensive channel braiding/meandering, heavy debris loading including several "jams", and accelerated bank cutting. Good to excellent gravel/cobble ASA is found in "stabilized" portions of the first nine sections, however, fast flows limit rearing primarily to boulder/debris induced pools and side channels.

Above Section 9, abrupt habitat changes occur as the gradient increases dramatically. Fast flows, steep V-notches with vertical barriers, and bedrock/boulder/large cobble substrate provide little opportunity for fisheries enhancement.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bridge Creek ADF&G Catalog No. 106-41-33  
 Survey Area "B" - Tributary (Converges at Section 5, 32m of main stem)

1. Section No.	1	2							
2. Compass Bearing	73	139							
3. Gradient	1	1.5							
4. Temperature: Air	16	16							
Water	11	11							
5. Water qual: a. color	1	1							
b. turbidity	1	1							
c. pH	7.8	7.8							
6. Streambottom Substrate	1	10	5						
	2	30	25						
	3	35	35						
	4	15	10						
	5	5	10						
	6								
	7	a) 4	b) 1	a) 10	b) 5				
7. ASA a. percent	3	2							
b. quality	2	2							
8. Water Width a. channel	11	12							
b. water	2	.75/35							
c. floodplain	2	2							
9. Stream Pools a. percent	30	50							
b. category	SF	SS							
10. Rearing Area	20	30							
11. Debris Loading	30	30							
12. Potential Barriers	N	N							
13. Enhancement/Rehab	N	N							
14. Streambank Veg.	1-3,5	1-3,5							
15. Upper Bank a. Left	5	3							
b. Right	0	0							
b. indic Left	N	N							
Right	N	N							
c. veg Left	N	N							
Right	N	N							
16. Lower Bank Left	U	U							
Right	GS	U							
17. Stab rating Left	1(1)	2(1)							
Right	1(1)	2(1)							
18. Stream Canopy Cover	2	3							
19. Fish Species SS	>6	0							
CT	4	0							
20. Sampling	N	N							

21. Comments

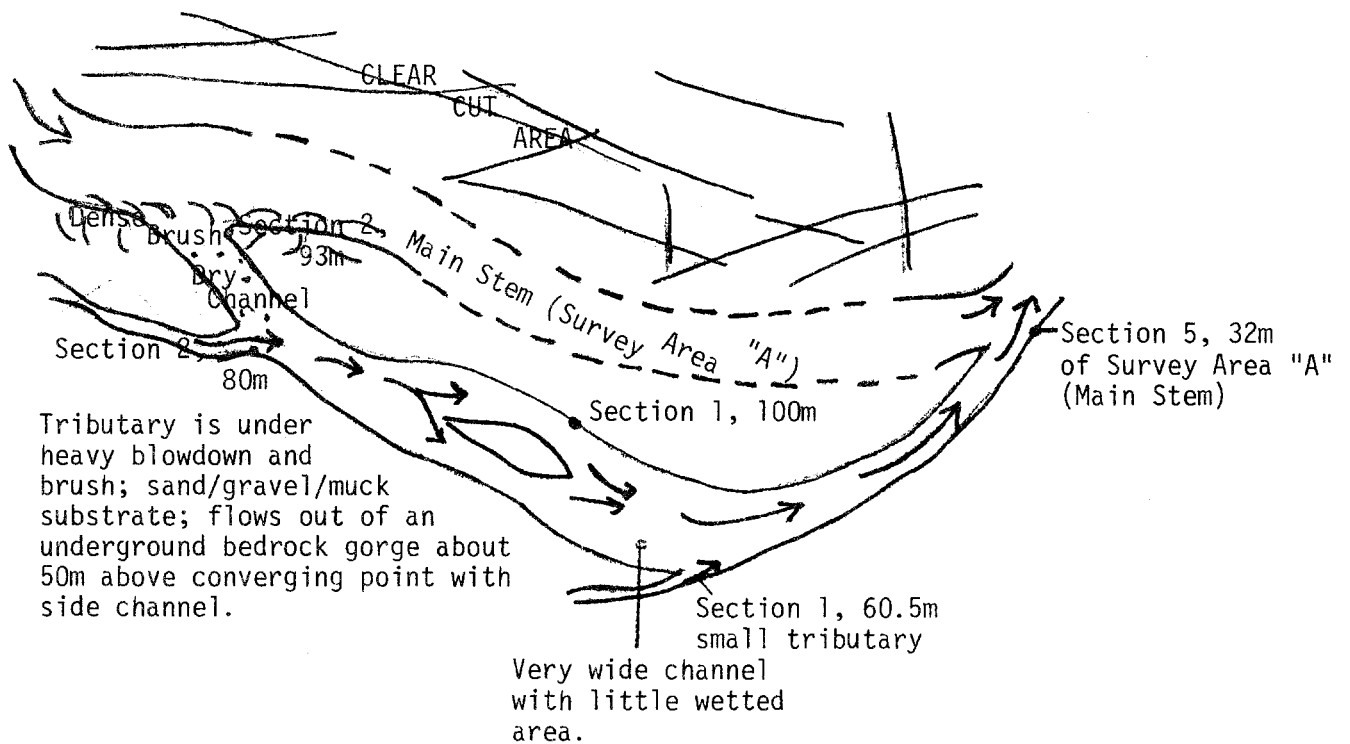
Section 1: 0m; Converges with main stem, then flows along the deeply undercut left bank for next 15m before flow is again visible.  
 60.5m; Small tributary on left side.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 80m; Tributary on left, under heavy debris for next 50m above confluence with survey.

This tributary was found to yield the flow in what was discovered to be a side channel from the main stem (see diagram). 93m of Section 2; the side channel diverges from the main stem under dense brush and alder saplings.



Tributary is under heavy blowdown and brush; sand/gravel/muck substrate; flows out of an underground bedrock gorge about 50m above converging point with side channel.

Drawing is not to scale

# FISH SAMPLING FORM

Stream Name Bridge Creek ADF&G Catalog No. 106-41-33 Date 9/15/82

Identify Survey Area A Water Temp. 10°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1145	1320	4 - SS	44mm 51mm 59mm 54mm	Section 4; 40m in DS pool on right side under log.
2	1150	1325	1 - CT 1 - DV	103mm	Section 5; DS pool under bank on right side.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## FISH SAMPLING FORM

Stream Name Bridge Creek ADF&G Catalog No. 106-41-33 Date 9/14/82

Identify Survey Area A Water Temp. 10°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1525	1640	0	--	Section #11; Undercut rocks <u>above</u> barrier falls.
2	1530	1635	1 - DV	--	Section #11; Right side in pool <u>above</u> first barrier falls.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

Date: 10/29/82

FISHERIES REHABILITATION AND/OR ENHANCEMENT  
NEW PROJECT OPPORTUNITY FORM

1. WHAT (give a brief description):

Heavy slash and log debris from logging activity on right bank of stream and blowdown of the stream buffer strip.

2. WHERE (be specific):

Bridge Creek, which converges with the intertidal zone of Big Creek (106-41-34) in Red Bay, North Prince of Wales Island, 200-300m above mouth of stream.

3. BENEFITS:

Prevent further stream migration which has caused lower bank failures releasing silt to foul downstream ASA.

4. SUBMITTED BY (name, address, telephone, etc.):

Laura Murph and Ted Mickowski  
ADF&G  
Box 667  
Petersburg, Alaska 99833  
  
Phone 907-772-3801

# LEVEL 1 FILE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay - West #2 3. Lat. 56°15'55"
2. ADP&G Catalog No. -- 3. Long. 133°20'35"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-5
7. Aerial Photo No. 71-17-9-27
8. Bay/Drainage Red Bay 9. Access 2, 6, 4 10. Camping 4
11. Present Land Use a. None 11b. Game trails
12. Historical Land Use None observed
13. Stream Origin 3 4 5 6 14. Flow Stage 2
15. Flow estimated <1 cfs  
method width depth length constant time grid flow
16. Temp. Sensitivity Shallow depth, low velocity, muskeg source
17. Beaver 5 18. Type aquatic Veg. -- 19. Density Aquatic Veg. --
20. Adult Salmon N 21. Intertidal a. gradient 1.5%
- b. bottom type % fines 90 % c. ASA 0
- gravel small cobble 10 % d. schooling N
- large cobble/boulders/bedrock 0 % e. shellfish N
- f. No anchorage nearby; must anchor at head of tide flats on right or left shores.

## 22. Comments

Stream flows into (below treeline) a large shallow pool in a large grassy flat. Pool appears stagnant with dense aquatic vegetation and muck substrate.

See Red Bay West #] map for location.

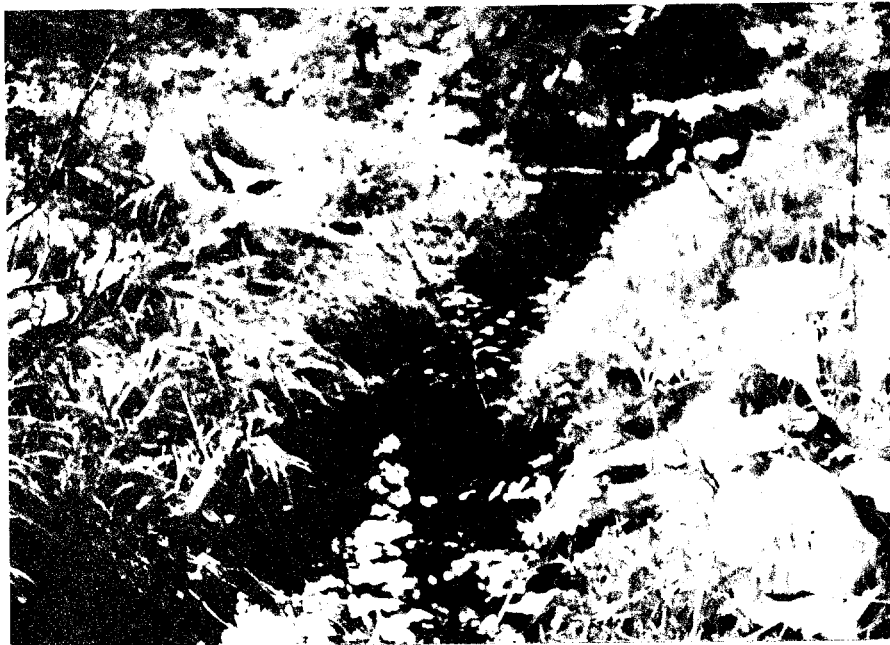
23. Investigators Murph
24. Date 9/15/82 25. Time 1420 1500 26. Weather 6  
start end
27. Photos

R-10 2600-3a (1/81)

Red Bay West #2



1. View of Intertidal Pool in Tide Flat Looking Downstream From Section #1, 0.0m of Survey.



2. Typical Rearing Habitat in Upper Section 1 and Section 2. Slough-like With Deep Channel and Dense Vegetation Overhang.



# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - West #2

ADF&G Catalog No. --

1. Section No.	1	2						
2. Compass Bearing	235	203						
3. Gradient	.5	.5						
4. Temperature: Air	16	16						
Water	11.5	11.5						
5. Water qual: a. color	3	3						
b. turbidity	1	1						
c. pH	6.5	6.5						
6. Streambottom Substrate	1	0	0					
	2	1	3					
	3	4	5					
	4	10	10					
	5	45	25					
	6	25	45					
	7	15	2	10				
7. ASA a. percent	--	--						
b. quality	--	--						
8. Water Width a. channel	8.5	1.0						
b. water	8.5	1.0						
c. floodplain	2	1						
9. Stream Pools a. percent	90	95						
b. category	SS	SS						
10. Rearing Area	50	60						
11. Debris Loading	15	10						
12. Potential Barriers	N	N						
13. Enhancement/Rehab	N	N						
14. Streambank Veg.	1-5	1-5						
15. Upper Bank a. Left	5	0						
b. Right	5	0						
b. indic Left	N	N						
Right	N	N						
c. veg Left	N	N						
Right	N	N						
16. Lower Bank Left	U	U						
Right	GS	U						
17. Stab rating Left	1(1)	1(1)						
Right	1(1)	1(1)						
18. Stream Canopy Cover	1	3						
19. Fish Species SS	--	--						
CT	>6	<6						
20. Sampling	Y	N						

21. Comments

Section 1: 0m; Treeline (head of large shallow pool in grass flats).  
30m; Stream becomes "slough-like" flowing through a muskeg/  
forest area.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Stream Evaluation:

This stream flows through a low profile forest/muskeg in a "slough-like" channel with a sand/muck substrate. The first 30m of stream (inside treeline) has gravel/sand substrate but no observed ASA. Excellent pool rearing area where juvenile CT observed. Little fisheries importance.

# FISH SAMPLING FORM

Stream Name Red Bay - West ADF&G Catalog No. -- Date 9/15/82  
Identify Survey Area A Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1425	1500	0	--	Section 1; 23m, right side undercut bank (only site observed with sufficient depth to set a minnow trap).

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# FIELD NOTE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2009.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

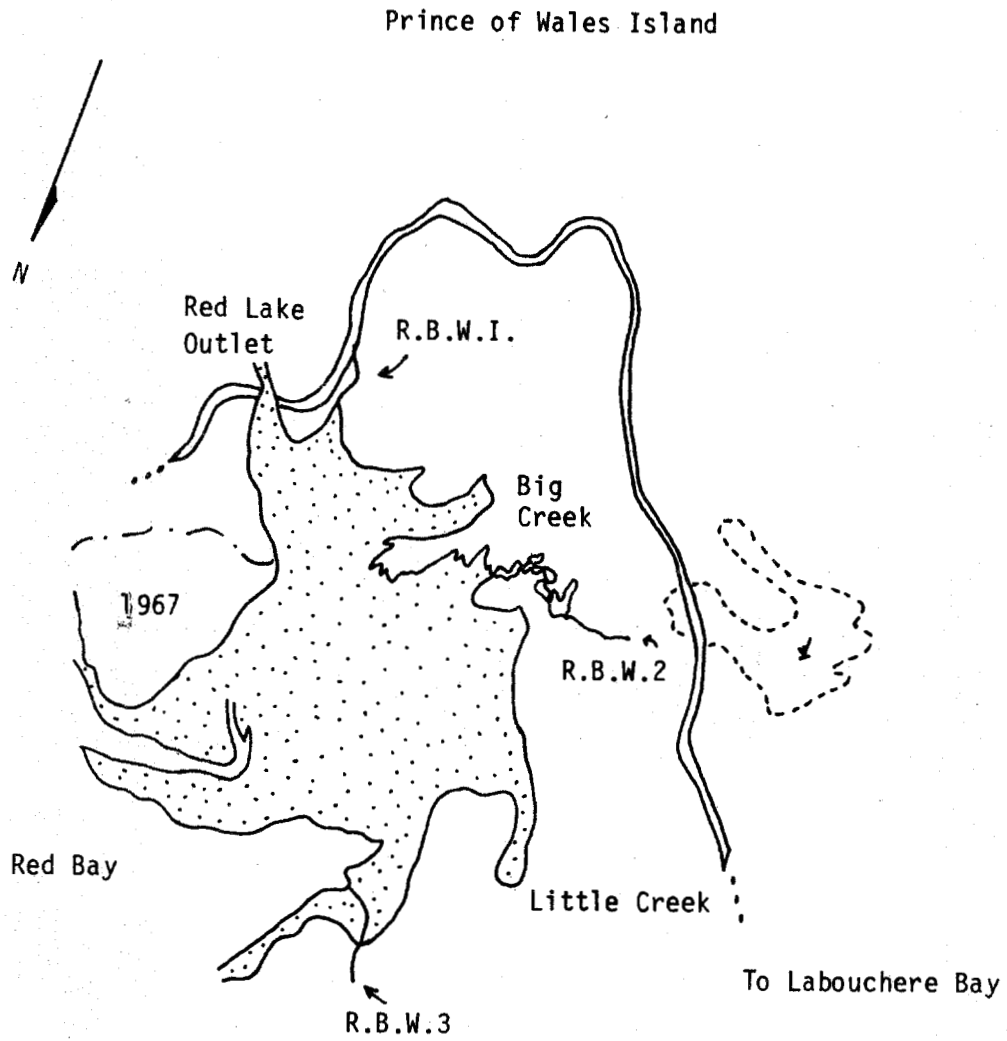
Part 2 - Instructions for completing this part are found in FSH 2009.23 R-10 Section 330.42.

1. Stream Name Red Bay - West #1 3. Lat. 56°15'50"
2. ADI&G Catalog No. -- 3. Long. 133°20'03"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-5
7. Aerial Photo No. 71-17-9-26 & 27
8. Bay/Drainage Red Bay 9. Access 2 4 10. Camping 4
11. Present Land Use a. crossed by #5600 logging road with culvert 11b. Dense brush
12. Historical Land Use None observed
13. Stream Origin 3 5 6 14. Flow Stage 2
15. Flow method, width, depth, length, constant, time, estimated, <1 cfs  
grid flow
16. Temp. Sensitivity Shallow water depth, low velocity
17. Beaver 5 18. Type aquatic Veg. 1 19. Density Aquatic Veg. 2
20. Adult Salmon N 21. Intertidal a. gradient 9%
- b. bottom type % fines 90% c. ASA 0
- gravel small cobble 9% d. schooling N
- large cobble/boulders/bedrock 1% e. shellfish Y
- f. No anchorages near outlet due to long tide flat; must anchor to right or left side of flat.
22. Comments  
21e. A few clams observed.

23. Investigators Murph
24. Date 9/15/82 25. Time 0930 1100  
start end
26. Weather 5, 3
27. Photos

R-10 2600-3a (1/81)

# Red Bay West #1-3



Red Bay West #1



1. Intertidal Zone Looking Downstream Into Red Bay.



2. Upper Intertidal Zone Looking Upstream.

Red Bay - West #1

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
---------	---------------	--------------	----------	--------------	---------	---------------	--------------	----------	--------------

1	100	1.0	2	2m <sup>2</sup>					
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# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - West #1

ADF&G Catalog No.--

1. Section No.	11	2						
2. Compass Bearing	105	126						
3. Gradient	12	12						
4. Temperature: Air	13	13						
Water	10	10						
5. Water qual: a. color	1	1						
b. turbidity	1	1						
c. pH	--	8						
6. Streambottom Substrate	1	8	13					
	2	5	7					
	3	10	15					
	4	20	15					
	5	55	40					
	6	2	--					
	7	--	10					
7. ASA a. percent	2	0						
b. quality	2	--						
8. Water Width a. channel	29	2.4						
b. water	1	1						
c. floodplain	1	1						
9. Stream Pools a. percent	0	80						
b. category	--	SF						
10. Rearing Area	10	0						
11. Debris Loading	20	80						
12. Potential Barriers	N	N						
13. Enhancement/Rehab	N	N						
14. Streambank Veg.	1,3,5	1,3,5						
15. Upper Bank a. Left	27	35						
b. Right	32	29						
b. indic Left	N	V-not						
Right	N	V-not						
c. veg Left	N	N						
Right	N	N						
16. Lower Bank Left	GS	GS						
Right	SS	U						
17. Stab rating Left	1(1)	1(1)						
Right	1(3)	1(3)						
18. Stream Canopy Cover	3	2						
19. Fish Species CT	3	--						
DV	1	--						
20. Sampling	Y	N						

21. Comments

Section 11: 0-50m; Dense stringy green algae and sparse Enteromorpha sp. in intertidal zone.  
 49m; Enter treeline.  
 56-88m; Heavy debris over stream.  
 60m; End intertidal zone; gradient is increasing.  
 89m; Large root wad has recently fallen into center of stream from left bank; stream flows underneath.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 0-50m; No ASA or rearing habitat; heavy brush and debris over stream and steep gradient with cascades and falls over boulder/bedrock substrate.  
9m; Tributary on right side with steep gradient and heavy debris; very narrow channel width.

Stream Evaluation:

This stream is of little fisheries value due to lack of ASA and rearing habitat. It is characterized by steep gradients, heavy debris and brush over stream channel and fast flow.

# FISH SAMPLING FORM

Stream Name Red Bay - West #1 ADF&G Catalog No. -- Date 9/15/82

Identify Survey Area A Water Temp. 10°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1010	1040	0	--	Section 1; 66m in pool; fish observed.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A,B,C,D,E,F 2. Equipment X
3. Historical Fish Species RS PS CS SS
4. Section Length 100m

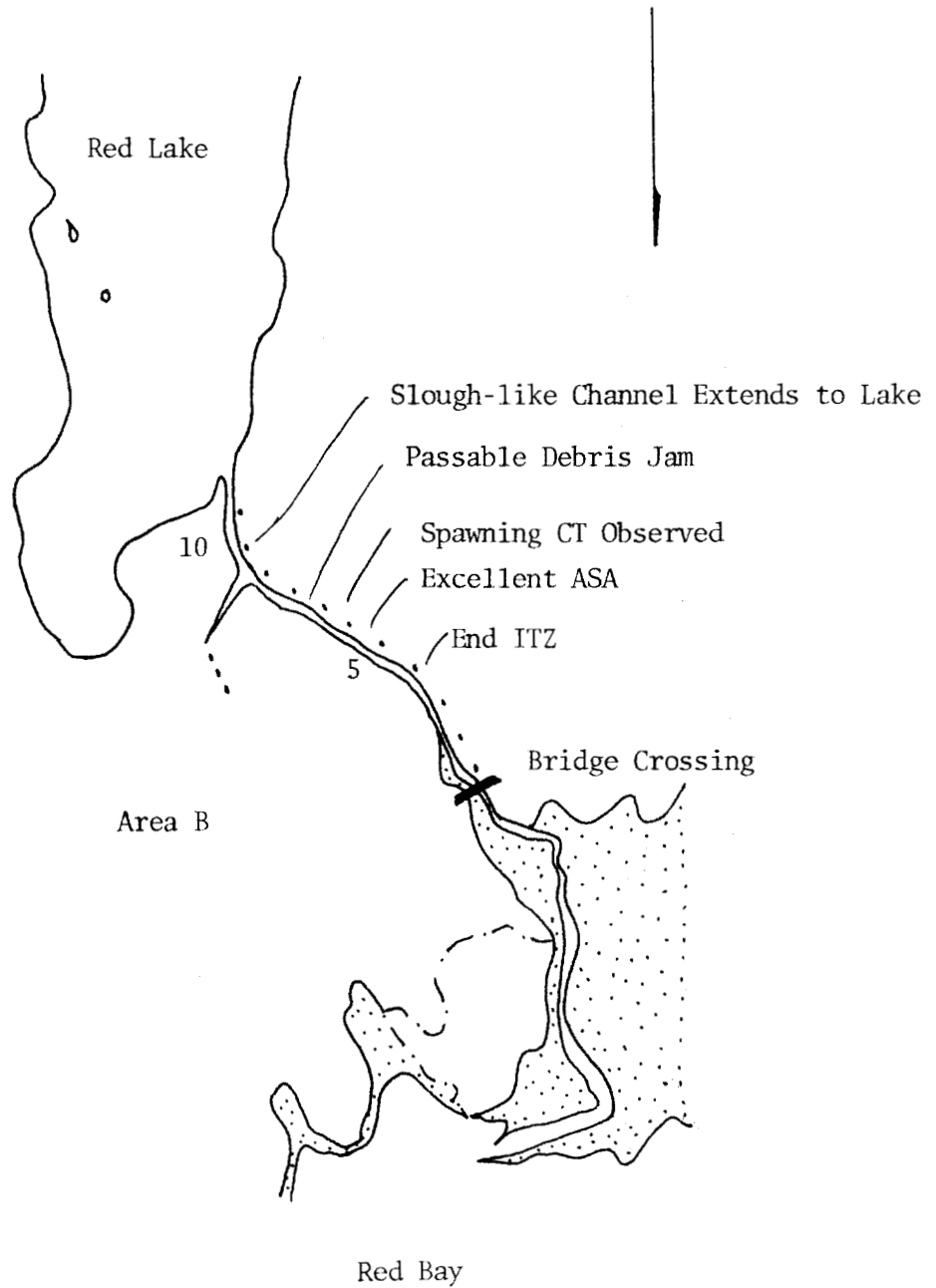
Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

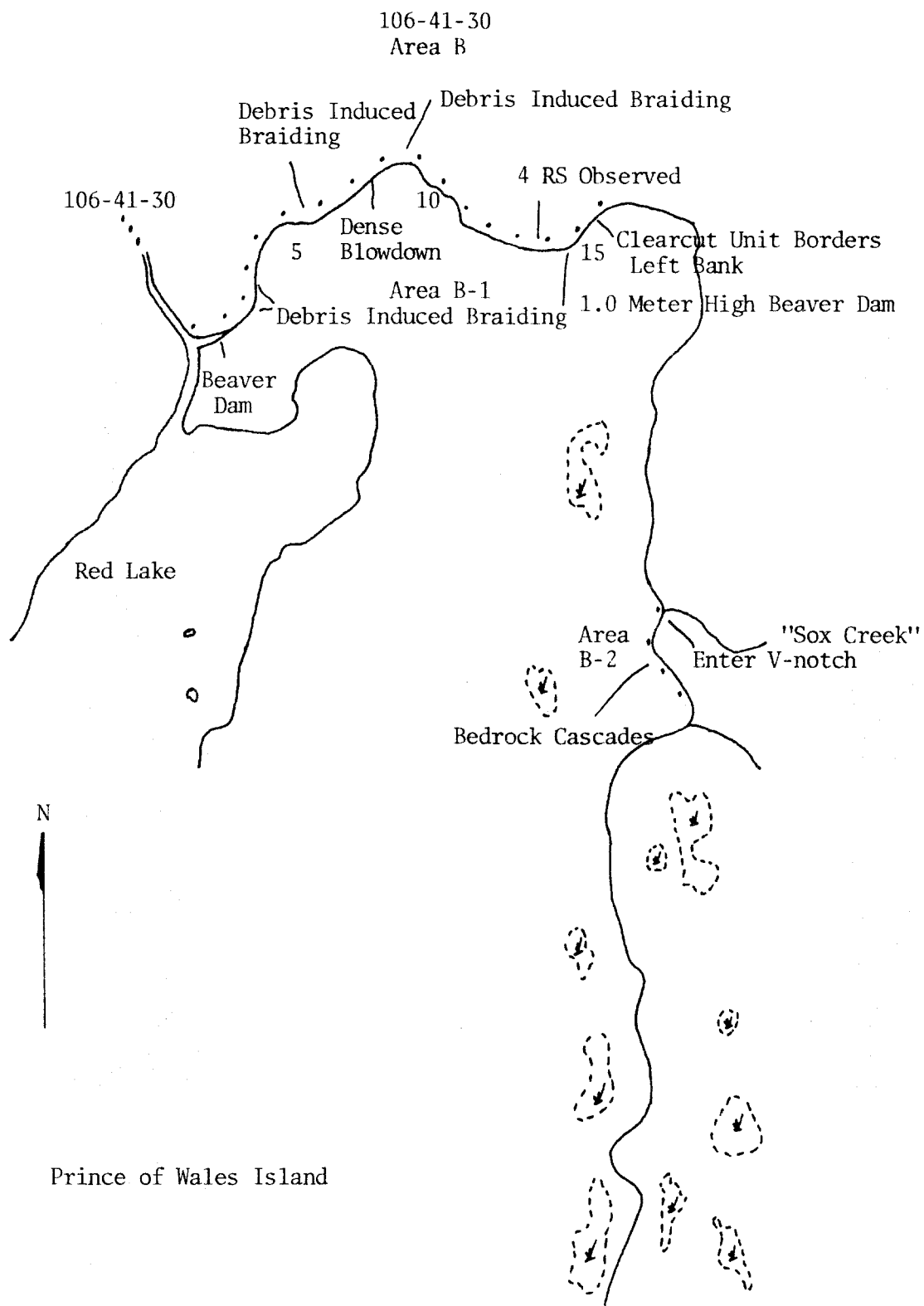
1. Stream Name Red Lake Outlet & East Fork of Outlet 3. Lat. 56°15'45"
2. ADF&G Catalog No. 106-41-30 & 106-41-32 3. Long. 133°19'45"
4. Agency Unit 05 5. Mgmt Area 532&533K 6. USGS Map No. PsbG B-4
7. Aerial Photo No. 71-18-8-104 through 106; 71-17-9-26 & 27
8. Bay/Drainage Red Bay 9. Access 1 - 6 10. Camping 3 (on lake)
11. Present Land Use a. Logging units and road along left bank of east fork. 11b. FS trail to cabin along left bank of creek; bear trails.
12. Historical Land Use Road crossing over ITZ. none observed
13. Stream Origin 1 3 5 6 14. Flow Stage 1
15. Flow Em, 5.42m, .13m, 11.5m, 0.8, 16.42<sup>sec</sup>, --, 14.cfs  
method width depth length constant-time grid flow
16. Temp. Sensitivity lake source
17. Beaver 4 18. Type aquatic Veg. 1,3,4 19. Density Aquatic Veg. 1
20. Adult Salmon y 21. Intertidal a. gradient .5
- b. bottom type % fines 15% c. ASA 11%
- gravel small cobble 30% d. schooling y
- large cobble/boulders/bedrock 55% e. shellfish y
- f. Anchorage at mouth of creek ITZ for large and small boats along left bank.
22. Comments
  1. 20d. Off mouth of outlet; DS pools in ITZ and lower portion of stream above ITZ. 20e. Numerous clam shells and Dungeness crab observed on beach.
  2. 50 adult RS and 6 CS under Red Creek bridge. 12 jumpers seen in estuary.

\*Main Stem Survey: Date: 8/26/82 Time: 0920-1330 hrs Weather: 1,5  
 Survey Area B: " 8/27&28 " 0925-1530/0930-1410 " 6,3  
 Survey Area C&D: " 9/14/82 " 1115-1225/1405-1420 " 1,3  
 Survey Area E: " 9/10/82 " 0930-1030 " 1  
 Survey Area F: " 9/9/82 " 1620-1015 " 1,3 (high flow)
23. Investigators Murph/Mickowski
24. Date 8 / 26 / 82 25. Time 0920 1330 26. Weather 1, 5  
start end
27. Photos \_\_\_\_\_

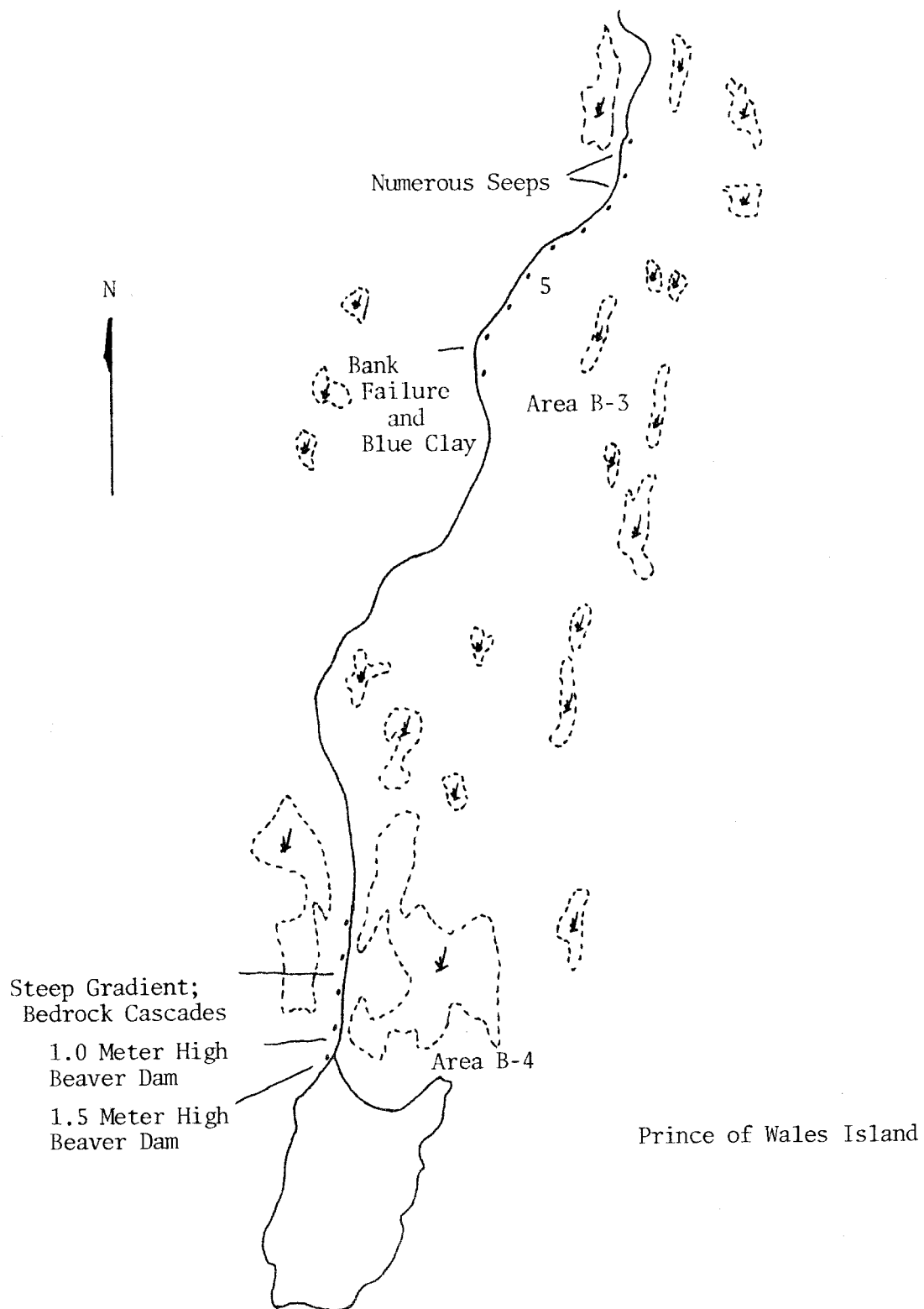
R-10 2600-3a (1/81)

Prince of Wales Island



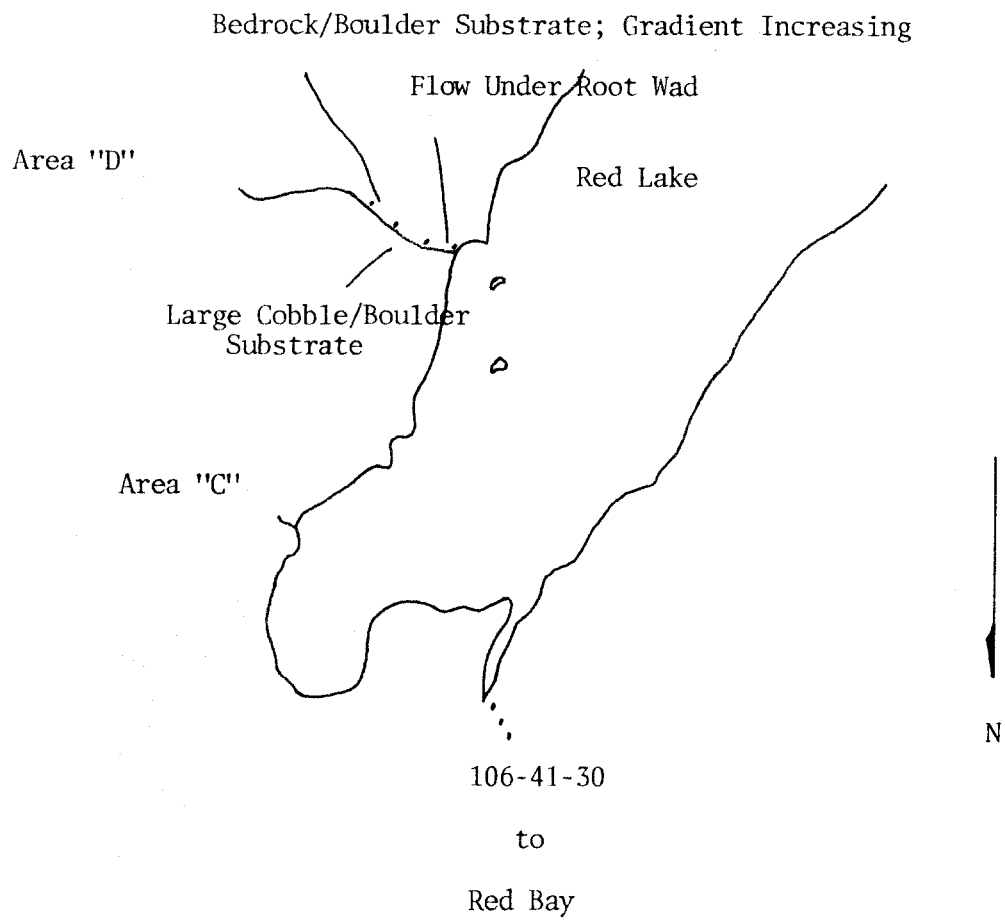


106-41-30  
Area B



106-41-30

Prince of Wales Island



106-41-30



1. The ITZ looking upstream along the main channel to the road crossing. Intertidal ASA is fair but spotty due to large cobble and boulders.



2. The ITZ is quite braided through the mud flat below the bridge.





3. Section 2I: Wide channel with gravel and sand substrate interspersed by large boulders provides spotty ASA.



4. Section 5: Downstream view of several blowdown induced "holding" areas. Milling chum salmon and Dolly Varden were observed.



5. Section 6: Gravel riffles provide excellent spawning habitat. Spawning CT observed.



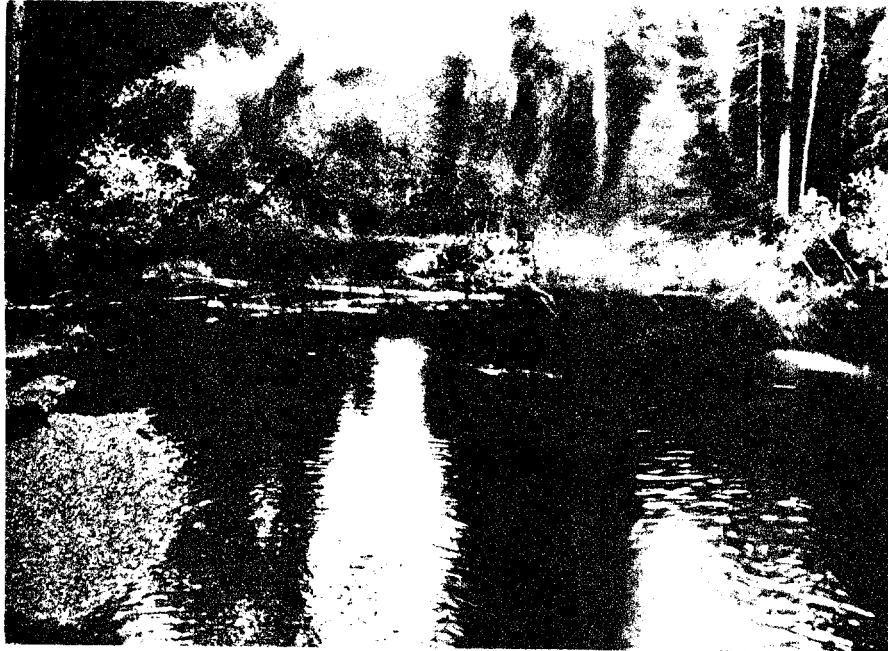
6. Section 7: "Passable" debris jam, 100 m below "East Fork" confluence. May warrant removal at later date.



7. Section 8: "East Fork" of Red Creek converges with the main stem via the left bank. Cutthroat trout, sockeye and chum salmon were observed "milling" at mouth.



8. Section 9 & 10: Slough-like channel extends to lake proper. Copious aquatic and overhanging vegetation provides excellent rearing cover. No ASA observed.



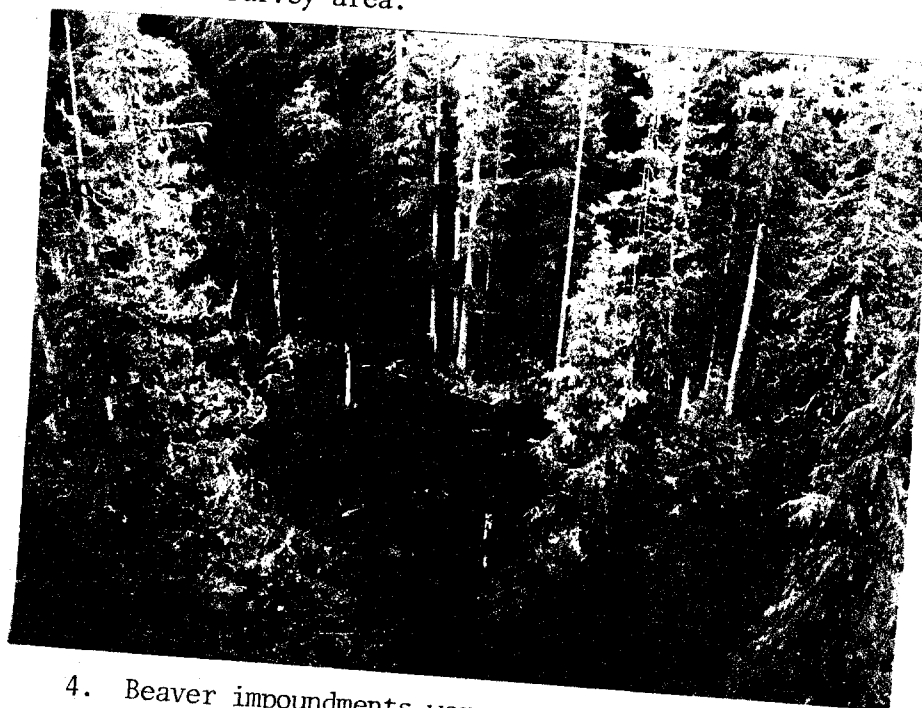
1. Area "B-1": Low velocity flow, gravel substrate, and copious debris characterize the confluence of Area "B" and Area "A".



2. Area "B": Section 16: Clearcut unit extends to the left bank. Copious debris and beaver activity has induced channel migration.



3. Area "B-2": Moderate gradient and coarse substrate culminate in several sets of bedrock cascades. Rearing SS fry were observed in peripheral pools throughout the survey area.



4. Beaver impoundments were common along the left bank between survey area "B-2" and "B-3".

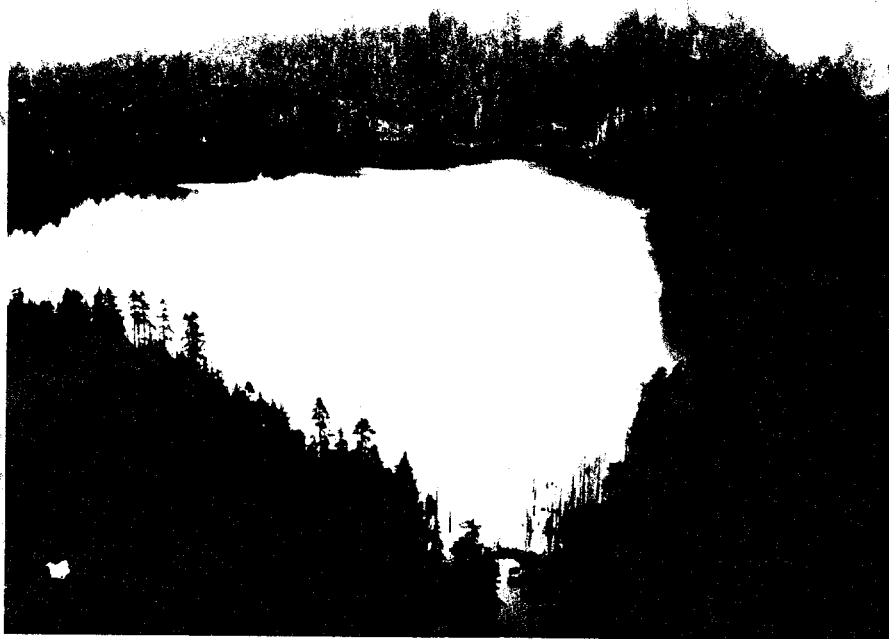


5. Area "B-3": Moderate gradient and a primarily cobble substrate provide limited ASA.



6. East Fork: Approximately 1200 m below lake, a steep bedrock/boulder channel represents a potential migratory impass.

106-41-30



7. Area "B-4": Headwater lake borders new tie road. Note beaver dam on outlet, lower right.

Red Lake  
106-41-30

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Area A					Area B-2				
2I	100	9.7	3	29.1	1	100	7.8	1	7.8m <sup>2</sup>
3I	100	19	10	190	Area B-3				
4	100	17	2	34	1	100	6.5	3	19.5
5	100	13	12	156	2	100	4.6	7	32.2
6	100	13	15	195	3	100	5.5	2	11
7	100	12	18	216	4	100	5	3	15
8	100	16.5	15	247.5	Total				
Total				1,067.6m <sup>2</sup>					77.7m <sup>2</sup>
Area B-1					Area C				
2	100	30	7	210	2	100	1.5	10	15m <sup>2</sup>
3	100	19.5	8	156	Area D				
5	100	15	8	120	1	100	5.5	70	385
6	100	9.5	5	47.5	2	100	2.3	50	115
7	100	9	15	135	Total				
8	100	20	1	20					500m <sup>2</sup>
9	100	11	10	110	Area E				
10	100	9.5	7	66.5	1	100	9.8	10	98m <sup>2</sup>
11	100	5.3	10	53					
12	100	9	7	63					
13	100	12	20	240					
14	100	4.4	8	35.2					
15	100	12	2	24					
16	100	12.4	2	24.8					
Total				1,305m <sup>2</sup>					



Red Lake  
106-41-30

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	length (m)	Width (m)	ASA %	ASA Total
Area F 106-41-32									
1	100	12	15	180					
2	100	25	15	375					
3	100	7.6	35	266					
4	100	9.2	45	414					
5	100	8.6	65	559					
6	100	29.5	75	2,212.5					
7	100	8	75	600					
8	100	6.4	40	256					
9	100	5.5	15	82.5					
10	100	9	15	135					
11	100	3.9	15	58.5					
Total				5,138.5m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Creek Outlet  
Survey Area "A"

ADF&G Catalog No. 106-41-30

1. Section No.		1I	2I	3I	4	5	6	7	8
2. Compass Bearing		95	83	72	65	71	61	65	82
3. Gradient		1.5	2	2	1	1	1.5	1	1.5
4. Temperature: Air		16.5	16.5	16.5	16.5	16	16	16	16
Water		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
5. Water qual: a. color		1	1	1	1	1	1	1	1
b. turbidity		1	1	1	1	1	1	1	1
c. pH		8	8	8	8	7.8	7.8	7.8	7.8
6. Streambottom Substrate	1	35	25	20	4	5	12	20	--
	2	25	20	15	--	--	10	10	--
	3	10	20	20	15	10	15	10	10
	4	10	20	25	45	52	40	35	45
	5	20	10	20	25	30	20	15	20
	6	--	--	--	--	--	--	--	20
	7	--	a) 5		a) 8 c) 3	c) 3	b) 1 c) 2	a) 5 b) 2 c) 3	c) 5
7. ASA a. percent		0	3	10	2	12	15	18	15
b. quality		--	1	1	1	1	1	1	1
8. Water Width a. channel		48	21.5	25	20	14.5	25	27	36
b. water		30	9.7	19	17	13	13	12	8.5/13
c. floodplain		2	2	1	2	2	2	2	2
9. Stream Pools a. percent		75	25	45	95	80	65	40	50
b. category		SS	SF/SS	SS/SF	SS	DS/SS	SS	SS	SS
10. Rearing Area		70	25	20	35	40	20	25	20
11. Debris Loading		1	1	3	7	9	3	8	5
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	Y	N
14. Streambank Veg.		1-5	1,3,5	1-3,5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank a. Left		9	36	31	10	28	21	18	10
b. Right		20	42	40	26	79	27	22	22
b. indic Left		N	V-not	*	N	N	N	N	N
Right		N	V-not	*	N	N	Steep	N	N
c. veg Left		N	N	N	N	N	N	N	N
Right		N	N	N	N	N	N	N	N
16. Lower Bank Left		SS	SS	GS	GS	SS	GS	GS	U
Right		GS	GS	GS	U	SS	GS	U	GS
17. Stab rating Left		1(3)	1(2)	1(1)	1(1)	1(3)	1(1)	1(1)	1(1)
Right		1(1)	1(2)	1(1)	1(1)	1(3)	1(3)	1(1)	1(3)
18. Stream Canopy Cover		3	3	3	3	2	3	3	3
19. Fish Species (fry) SS		--	1	>6	6	>6	<6	>6	>12
juveniles: DV/CT		--	--	--	0/1	--	--	--	--
unknown		--	>12	>6	--	--	--	--	--
CO		>6	--	1	--	2	--	--	--
SB		>200	>50	>12	--	--	--	--	>20
20. Sampling		Y	N	N	N	Y	Y	N	N

## 21. Comments \*Steep Slope

Section 1I: 0m; Located at base of first riffle area above 1000 Road bridge crossing.

Section 2I: Old slide area on left upper bank (blowdown?); steep slopes.

Section 3I: 21m; End intertidal zone. Dense Enteromorpha sp. on rocks throughout intertidal zone.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 4: 57-70m; Heavy log debris in and over stream. Brown algae on 90% of rocks in Sections 3I, 4 and 5.  
70m; Right bank is a 20 foot high wall of bedrock 43m long with large, fractured boulder broken off face. Left lower bank is bedrock extending into stream (upper bank is low and undercut).

At base of rock face there is a pool with gravel substrate in upper 50m of Section 4 where a school of 45-50 adult salmon were observed. 70% RS with 30% SS/CS.

Section 5: 13m; Log debris in stream. Nice gravel section; adult CS and CT holding in pools beneath riffles.

Section 6: Spawning CT observed; 30-40 adult CS in pool below a sunken log.

Section 7: 4m wide side channel along right bank.  
30m; Log debris in stream causing braiding for 11m. A bedrock chute around log jam is a potential problem and it may be worthwhile to buck up blowdown to avoid a complete block in the future.

Section 8: 34-61m; Mouth of the East Fork of Red Lake Outlet on left side.  
60m; Beaver dam over right half of stream (incomplete dam).

Sections 7&8: Stream channel is wide with exposed sand/gravel bars and log debris over stream. Right bank is steep along entire reach. Left bank varies from GS to SS with 0% slope. Blowdown coming off hillside observed. RS seen spawning in mouth of East Fork.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Creek Outlet  
Survey Area "A"

ADF&G Catalog No. 106-41-30

1. Section No.	9	10					
2. Compass Bearing	109	126					
3. Gradient	1	1					
4. Temperature: Air	16	16					
Water	15.5	15.5					
5. Water qual: a. color	1	1					
b. turbidity	1	1					
c. pH	7.8	7.8					
6. Streambottom Substrate	1	--	--				
	2	--	--				
	3	--	--				
	4	5	5				
	5	45	45				
	6	45	45				
	7	c) 5	c) 5				
7. ASA a. percent	--	--					
b. quality	--	--					
8. Water Width a. channel	29.5	35est					
b. water	29.5	35est					
c. floodplain	2	3					
9. Stream Pools a. percent	100	100					
b. category	SS	SS					
10. Rearing Area	50	50					
11. Debris Loading	15	10					
12. Potential Barriers	N	N					
13. Enhancement/Rehab	N	N					
14. Streambank Veg.	1,3,5	1,3,5					
15. Upper Bank a. Left	8	0					
b. Right	24	16					
b. indic Left	N	N					
Right	N	N					
c. veg Left	N	N					
Right	N	N					
16. Lower Bank Left	SS	SS					
Right	SS	U					
17. Stab rating Left	1(3)	1(1)					
Right	1(1)	1(1)					
18. Stream Canopy Cover	3	3					
19. Fish Species	--	--					
	--	--					
	--	--					
	--	--					
20. Sampling	N	N					

21. Comments

Section 8, 9, 10: "Pond-like" channel with numerous sloughs extending into a marsh/forest ecotone comprises the left bank. The right bank remains forested and steep. Copious aquatic vegetation including lily pads, horse-tails, and freshwater algae. Substrate is typically detritus,

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

rotting logs and muck with isolated patches of gravel. No rearing or milling fish were observed, however, freshwater clams were common.

Approximately 170 meters beyond survey end was "lake edge". Dense lily pads extended into lake proper. For habitat description see comments above (Sections 8, 9, and 10).

Stream Evaluation:

Good boulder/debris induced rearing for all species throughout. Good ASA available for PS, CS, RS, and SS.

Adult salmon observed: Section 1I: 0  
2I: 0  
3I: 45-50 RS; 1 SS; 1 CT; 1 CS  
4 : 0  
5: more than 10 CS; more than 100 DV  
6 : 4 CS; 1 RS  
7 : more than 12 CT; more than 6 SS  
8: more than 25 CT; 10 RS; more than 6 CS  
(observed in mouth of East Fork)

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name East Fork Red Lake Outlet ADF&G Catalog No. 106-41-30  
 Survey Area "B-1"

1. Section No.		1	2	3	4	5	6	7	8
2. Compass Bearing		339	341	300	277	339	344	332	341
3. Gradient		2	1.5	1.5	1.5	1.5	2	2	2
4. Temperature: Air		14.5	14.5	14.5	14.5	14	14	14	14.5
	Water	13	13	13	13	12.5	12.5	12.5	13
5. Water qual: a. color		1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	7.7	7.7	7.7	7.7	7.8	7.8	7.8	7.8
6. Streambottom Substrate	1	--	--	--	--	5	--	--	--
	2	--	--	--	--	8	--	--	--
	3	10	20	25	30	25	25	40	30
	4	45	55	50	40	35	45	45	50
	5	20	15	15	20	22	25	10	17
	6	15	--	--	--	--	--	--	--
	7	b <sub>1</sub> c <sub>1</sub>	b <sub>3</sub> c <sub>7</sub>	b <sub>4</sub> c <sub>6</sub>	b <sub>5</sub> c <sub>5</sub>	b <sub>2</sub> c <sub>3</sub>	a <sub>1</sub> b <sub>2</sub> c <sub>2</sub>	a <sub>1</sub> b <sub>2</sub> c <sub>2</sub>	b <sub>2</sub> c <sub>1</sub>
7. ASA a. percent		--	7	8	--	8	5	15	1
	b. quality	--	1	1	--	1	1	1	1
8. Water Width a. channel		27	30	19.5	26	21	11	16	22
	b. water	13	30	19.5	18	15	9.5	9	20
	c. floodplain	2	2	2	2	2	2	2	1
9. Stream Pools a. percent		100	70	75	70	60	65	35	60
	b. category	DS/SS	DS/SS	DS/SS	SS/DS	SS/DS	SS/DS	SS/DS	DS/SS
10. Rearing Area		60	45	45	60	30	45	25	45
11. Debris Loading		9	15	9	25	6	17	6	17
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		Y	N	N	N	N	N	N	N
14. Streambank Veg.		3,5	1-5	1-5	1-5	1,3,5	1-3,5	1-5	1-5
15. Upper Bank a. Left		7	18	11	27	46	8	15	10
	b. Right	0	6	<10est	8	8	27	16	32
	b. indic Left	N	N	N*	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
	c. veg Left	N	N	N	N**	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank Left		SS	U	U	SS	SS	GS	U	U
	Right	U	SS	U	U	GS	U	GS	GS
17. Stab rating Left		1(1)	1(1)	1(1)	2(1)	1(3)	1(1)	1(1)	1(1)
	Right	1(1)	1(1)	1(1)	1(1)	1(1)	1(1)	1(2)	1(1)
18. Stream Canopy Cover		3	3	3	3	2	2	2	3
19. Fish Species juvenile SS		>6	>12	>12	>6	>12	>12	>12	>6
	CT	--	--	--	<6	6	--	--	--
	adult RS	>50	--	--	--	--	--	--	--
	adult CS	>25	--	--	--	--	--	--	--
	SB	>12	--	--	--	--	--	--	--
20. Sampling		N	N	N	N	N	N	N	N

21. Comments \*Heavy blowdown \*\*Blowdown

Date: 8/27/82 Time: 0925-1530 Weather: 3

Section I: 0.0m; Confluence with Red Lake Outlet at Section 8, 34-61m.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 1: 70m; A .8m beaver dam has blocked the main stem creating a .2-.3m "cascade". Approximately 50 RS and 30 CS were observed milling and spawning from the confluence with Area "A" to the dams plunge pool. Six redds were visible.

Section 2: Heavy debris throughout causing extensive stream braiding within channel.

Section 3: 81m; Blowdown along left upper bank and over stream extends to S5: 25m. Stream braiding common.

Section 4: 50m; Blowdown along right upper bank extends to S5; 57m.

Section 5: 57-71m; Beaver den of packed mud along left lower bank. 57m; Braiding ends; debris reduced.

Section 6: 38m; Debris induced channel braiding. Blowdown along left bank extends to 82m. 46-57m; Instream debris pile.

Section 7: 90m; Incomplete beaver dam of recent construction, .15m in height.

Section 8: 33m; Heavy blowdown from both banks extends to S13: 80m, resulting in abundant instream debris and substrate "silting".

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name East Fork Red Lake Outlet ADF&G Catalog No. 106-41-30

Survey Area "B-1"

1. Section No.		9	10	11	12	13	14	15	16
2. Compass Bearing		323	57	61	42	35	1	311	345
3. Gradient		2.5	1.5	2.5	2	3	3	5	2
4. Temperature: Air		14.5	14.5	14.5	14.5	15	15	15	15
	Water	13	13	13	13	13	13	13	13
5. Water qual:	a. color	1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
6. Streambottom Substrate	1	--	--	--	1	3	10	--	--
	2	4	2	10	11	15	18	18	5
	3	35	35	40	40	45	40	22	20
	4	40	38	35	30	25	20	30	40
	5	15	15	10	10	5	5	23	25
	6	--	--	--	--	--	--	--	--
	7	b) 3 c) 3	b) 5 c) 5	b) 2 c) 3	b) 3 c) 5	a) 5 b) 1 c) 1	b) 4 c) 3	b) 3 c) 4	b) 3 c) 7
7. ASA	a. percent	10	7	10	7	20	8	2	2
	b. quality	1	1	1	1	2	1	1	1
8. Water Width	a. channel	18	9.5	21	18	14	11	21	16
	b. water	11	9.5	3.1 2.2	9	12	4.4	12	12.4
	c. floodplain	2	3	2	2	2	3	2	3
9. Stream Pools	a. percent	40	70	35	30	25	35	45	85
	b. category	DS/SS	SS/DS	DS/SS	SS/DS	SS	SF/DS	DS/SS	SS/DS
10. Rearing Area		35	45	30	20	15	30	35	40
11. Debris Loading		25	20	15	9	6	9	20	15
12. Potential Barriers		N	N	N	N	N	N	Y	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank	a. Left	4	8	6	9	3	3	0	0
	b. Right	16	16	5	12	18	26	0	0
	b. indic								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	U	SS	U	U	U	U	U	GS
	Right	SS	U	U	U	U	GS	GS	U
17. Stab rating	Left	2(1)	2(1)	1(1)	1(1)	1(1)	2(2)	2(1)	1(1)
	Right	1(1)	1(1)	2(2)	2(1)	2(1)	1(3)	2(2)	1(1)
18. Stream Canopy Cover		2	3	3	3	3	2	2	3
19. Fish Species	juvenile SS	>12	>12	>6	>6	<6	<6	>12	>12
	CT	--	--	--	--	--	--	>6	1
	adult RS	--	--	--	--	--	4	--	--
	" CS	--	--	--	--	--	--	--	--
	SB	--	--	--	--	--	--	--	--
20. Sampling		N	N	N	N	N	N	N	N
21. Comments									

Section 9: 20m; Beginning of heavy debris in stream channel causing stream braiding.  
33m; Small seep on left side; no ASA; possible rearing area; less than 1m wide channel.  
40m; Flood channel along left bank which extends to Section 10, 8m.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Date: 8/27/82 Time: 0925-1530 Weather: 3

Section 12: 86m; Dry side channel along left bank.

Section 13: 63m; Tributary on left has less than 1 cfs flow; large pools connected by 1.0 meter long riffles over a gravel/cobble substrate. Possible ASA during higher flows, excellent rearing area in pools. Coho fry observed in pools.

Section 14: 47m; Old slide on right upper bank overgrown with pioneer vegetation (i.e., devil's club and brush). Approximately 10m wide by 35-40m up the side.  
80m; 4 adult sockeye observed in pool.  
85m; Small side channel along right bank which diverges at Section 15, 3m.

Section 15: 11m; Flood channel along left bank; 10-12m wide; no flow at this time. Diverges approximately 70m above Section 16.  
67m; 8m wide side channel along right bank with approximately 3 cfs flow.  
77m; Beginning of blue/white flagging by USFS on main stem.  
86m; Beaver dam, approximately 1.0 meter high and in good repair on stream, and right side channel impounds a .9-1.2m deep pond where little silting has occurred and gravel is still exposed.

Section 16: 25m; Recent .5-.6 meter high beaver dam with break along right bank.  
67m; 1981-82 clearcut unit begins on left side to edge of bank.  
74m; Extensive stream braiding due to debris (aggravated by clearcut).

Above Section 16: Several more beaver dams in channel causing stream braiding. A 25m wide buffer strip of trees along left stream bank begins approximately 100m above Section 16.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name East Fork Red Bay Lake ADF&G Catalog No. 106-41-30  
 Survey Area "B-2" Outlet

1. Section No.	1	2	3				
2. Compass Bearing	157	101	68				
3. Gradient	5	3	2				
4. Temperature: Air	12	12	12				
Water	11.5	11.5	11.5				
5. Water qual: a. color	1	1	1				
b. turbidity	1	1	1				
c. pH	7.8	7.8	7.8				
6. Streambottom Substrate	1 20	20	20				
	2 20	25	35				
	3 15	25	25				
	4 20	10	12				
	5 5	--	5				
	6 --	--	--				
	7 a) 20	a) 20	b) 1 c) 2				
7. ASA a. percent	1	--	--				
b. quality	1	--	--				
8. Water Width a. channel	12	17	28.5				
b. water	7.8	8.5	3.35				
c. floodplain	2	1	1				
9. Stream Pools a. percent	35	35	30				
b. category	DS/SF	DS/SF	DS/SS				
10. Rearing Area	15	15	20				
11. Debris Loading	1	4	7				
12. Potential Barriers	N	N	N				
13. Enhancement/Rehab	N	N	N				
14. Streambank Veg.	1-5	1-5	1-5				
15. Upper Bank a. Left	29	15	13				
b. Right	5	46	38				
b. indic Left	V-not	N	N				
Right	N	V-not	N				
c. veg Left	N	N	N				
Right	N	N	N				
16. Lower Bank Left	U	GS	U				
Right	GS	U	U				
17. Stab rating Left	1(2)	1(2)	2(1)				
Right	1(2)	1(2)	1(1)				
18. Stream Canopy Cover	2	3	3				
19. Fish Species SS	<6	>6	>12				
CT	--	>6	--				
20. Sampling	N	Y	N				

## 21. Comments

Survey began at confluence of ravine/tributary with East Fork of Red Lake Outlet. Tributary named Sox Creek by USFS crews; left bank borders Unit 11-23A and is flagged coho rearing by USFS, 1979 (Hopper and Sautner).

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 1: 0m; Tributary A (Soxs Creek) on left bank. Nearly continuous cascade/falls of 3.5-5% gradient over boulder/cobble substrate. Heavy logging slash, approximately 35%. 1980's clearcut on left bank. 4 SS observed near confluence with main stem. No ASA, minimal rearing. Entering V-notch. 54-97m; First series of cascades over bedrock and boulders in 10-13m wide V-notch.

Section 2: 0m; Dry channel of muskeg drainage on left side. 55m; Second series of cascades (less gradient than first series). Side channel along left bank; less than .5 cfs flow, 20m long.

Section 3: 57.5m; Exposed blue clay along left bank of stream channel 8m long by 1m wide.

Reconnaissance above Section 3 showed similar habitat as in upper Section 2 and Section 3 with 15-20% debris loading. Coho fry identified in stream. No barrier observed.

Reach Evaluation

Bedrock and boulder cascades as stream crosses contour in V-notch. No SS barrier evidenced by visual sightings of SS fry and trap catches. CT common throughout survey. Substrate is primarily boulder/cobble with intermittent bedrock outcrops. Little debris, mostly old with recent alders from blowdown and bank undermining. Gradients are moderate, yet enough to keep a near continuous riffle action over large cobble/boulders (unsuitable for spawning). Pools are either debris or boulder induced or in seeps along main channel. Fair rearing, no ASA for anadromous salmon. Pockets of gravel exist and may be primary spawning medium.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name East Fork of Red Lake

ADF&G Catalog No. 106-41-30

Outlet Survey Area "B-3"

1. Section No.		1	2	3	4	5	6	7	8
2. Compass Bearing		43	114	101	132	113	119	122	83
3. Gradient		3	2.5	2.5	3	3	3	4	5
4. Temperature: Air		14.5	14.5	14.5	14.5	13.5	13.5	13.5	13.5
Water		11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
5. Water qual: a. color		1	1	1	1	1	1	1	1
b. turbidity		1	1	1	1	1	1	1	1
c. pH		7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
6. Streambottom Substrate	1	15	10	10	15	23	25	20	30
	2	33	35	30	30	35	35	40	30
	3	30	35	25	35	30	28	30	30
	4	15	15	25	13	10	10	8	7
	5	3	3	8	5	2	2	2	1
	6	--	--	--	--	--	--	--	--
	7	a) 2 b) 2	b) 2	b) 2	b) 2	--	--	--	b) 2
7. ASA a. percent		3	7	--	2	--	--	3	--
b. quality		1	1	--	1	--	--	1	--
8. Water Width a. channel		10	11.6	8.8	8.5	8.3	9.2	7.8	5.3
b. water		5.5/1.0	4.6	5.5	5.5	5.1	4.3	5.0	5.3
c. floodplain		3	3	3	2	3	3	2	1
9. Stream Pools a. percent		40	35	35	25	20	35	25	20
b. category		SS/DS	SS/DS	DS/SS	SF/DS	SF/SS	DS/SF	SF/DS	DS/SF
10. Rearing Area		25	20	25	15	15	20	15	10
11. Debris Loading		7	3	9	12	4	7	5	9
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1-5	1-5	1-5	1-5	1-5	1-5	1-5
15. Upper Bank a. Left		-	-	4	0	10	3	26	14
b. Right		0	0	14	0	0	11	0	8
b. indic Left		N	N	N	N	N	N	N	N
Right		N	N	N	N	N	N	N	N
c. veg Left		N	N	N	N	N	N	N	N
Right		N	N	N	N	N	N	N	N
16. Lower Bank Left		U	U	GS	U	U	U	U	U
Right		U	U	U	GS	GS	GS	GS	SS
17. Stab rating Left		1(1)	1(1)	1(2)	3(1)	2(1)	2(1)	2(1)	2(1)
Right		1(2)	1(1)	1(1)	1(1)	1(2)	1(3)	1(1)	2(2)
18. Stream Canopy Cover		2	2	1	1	2	1	2	2
19. Fish Species SS		>12	>12	<12	--	>12	>12	<6	>12
CT		1	--	--	--	--	--	--	--
20. Sampling		Y	Y	N	N	N	N	N	N
21. Comments	Survey Area begins at south edge of muskeg on right bank where muskeg meets stream edge (see stream map).								

### LEVEL THREE - HABITAT SURVEY FORM (Part 3)

#### 21. Comments Cont.

- Section 1: 14.5m; Dry flood channel along left side, converges.  
94m; Dry flood channel along left bank with stagnant pools, diverges.  
100m; Small seep on right side out of large muskeg; less than 1 cfs flow.
- Section 2: Several small seeps along right and left banks (90% are dry at this time) from muskegs on respective upper banks. Possible rearing areas.
- Section 4: 37m; Small tributary on left side of channel; less than 1 cfs flow.  
50m; Stream channel makes a sharp turn to 136° compass bearing with open canopy and large gravel bar between two flow channels.  
100m; Canopy closes.
- Section 5: 7.5m; Flood channel on right.
- Section 6: 64m; Tributary converges on left side; approximately 2.5 cfs flow; heavy brush over stream; 11.5°C water temperature; 8.0 pH; good ASA and rearing habitat. Primarily gravel substrate.  
72m; Tributary on right side; less than 1 cfs flow.
- Section 7: 74m; 6m wide channel joins stream from right at bend in main channel (to 97° compass bearing); almost no flow (less than .25 cfs); boulder/gravel substrate.
- Section 8: 18m; .6x1.2m bank of blue clay on left bank in stream. A small root wad has been undermined causing bank failure into stream.  
84m; Seep on left bank out of muskeg. A .6m drop over sunken log across entire main channel into .6-1.2m pool below.

#### Reach Evaluation

Stream is flowing between a series of muskegs on right and left upper banks with side slopes of 0-10% yielding large floodplains during peak flows. Many dry seep channels observed. Larger tributaries often contained excellent ASA for SS while the main stream had moderate rearing, but marginal ASA (4-7" cobble). The stream is characterized by 3-5% gradients, near continuous riffles/cascades, and boulder/cobble substrate. Pools were primarily debris or boulder induced. Debris was moderate to low density though stream sinuosity and sharp bends caused debris pileups. Good numbers of SS fry observed. Sections 7 and 8 show increasing gradient and narrowing channel width causing several 0.6-.9m falls over sunken logs into DS pools. Numerous bankside alder. Timber on upper banks looks excellent but is limited to stream and tributary banks.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name East Fork Red Lake Outlet ADF&G Catalog No. 106-41-30  
Survey Area "B-4"

1. Section No.	1	2	3	4			
2. Compass Bearing	81	97	107	111			
3. Gradient	5.0	3.5	3.5	3.5			
4. Temperature: Air	15	15	15	15			
Water	15.5	16	16.5	16.5			
5. Water qual: a. color	1	1	1	1			
b. turbidity	1	1	1	1			
c. pH	7.8	7.8	7.8	7.8			
6. Streambottom Substrate	1 25	25	30	45			
	2 25	35	30	25			
	3 25	20	20	15			
	4 11	5	7	8			
	5 --	2	4	7			
	6 --	--	--	--			
	7 a) 10 b) 4	a) 10 b) 3	a) 5 b) 4	--			
7. ASA a. percent	--	--	--	--			
b. quality	--	--	--	--			
8. Water Width a. channel	3.4	11	3.6	3.2			
b. water	3.3	1.5/2	3.6	3.2			
c. floodplain	2	1	2	1			
9. Stream Pools a. percent	15	15	15	10			
b. category	SS/SF	SS/SF	SS/SF	SF			
10. Rearing Area	10	10	10	5			
11. Debris Loading	6	4	6	4			
12. Potential Barriers	N	N	N	N			
13. Enhancement/Rehab	N	N	N	N			
14. Streambank Veg.	1-5	1-5	1-5	1,3-5			
15. Upper Bank a. Left	27	26	45	65			
b. Right	60	49	23	39			
b. indic Left	V-not	V-not	V-not	V-not			
Right	V-not	V-not	V-not	V-not			
c. veg Left	N	N	N	N			
Right	N	N	N	N			
16. Lower Bank Left	GS	U	GS	U			
Right	U	SS	U	GS			
17. Stab rating Left	1(1)	1(1)	1(2)	2(2)			
Right	1(1)	2(2)	1(1)	1(3)			
18. Stream Canopy Cover	1	2	2	2			
19. Fish Species juveniles SS	--	--	--	--			
CT	--	2	--	--			
20. Sampling	N	N	N	N			
21. Comments							

Section 1: 48m; Stream flow diverges and braids.  
78m; Stream converges.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: The second 50m of section is steep with cascades over boulders and 5.5% gradient.  
99m; Stream flow diverges.

Section 3: 22m; Stream flow converges.  
55m; Stream flow diverges to channels along right and left banks with isle between.

Section 4: 48m; Small beaver dam approximately 1m high; active and in good repair with .6-.9m deep pond.  
100m; Second beaver dam which impounds lake, approximately 1.5m high.

Reach Evaluation

The outlet stream flows through a rocky V-notch with +20% side slopes over a boulder/large cobble substrate densely overgrown with alder and brush. Frequent channel braiding, few pools, little debris and nearly continuous cascades characterize stream. Water temperatures cooled rapidly through the cascades as distance from lake increased.

The lake is formed at the outlet by two active beaver dams in a narrow V-notch impounding a natural bowl with knolls on all sides. The altimeter reading at the lakes edge (at second impounding dam) is 640 feet above sea level. The lake substrate was mud over sand/gravel with a water temperature of 17.5°C (14°C air temperature). Reported trout fishing in lake (i.e., local loggers/contractors).

No ASA observed and rearing habitat was minimal.

# FISH SAMPLING FORM

Stream Name Red Lake Outlet ADF&G Catalog No. 106-41-30 Date 8/26/82

Identify Survey Area A Water Temp. 15.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1020	1325	1 - SS 2 - CO	109	Section 11 in DF pool, boulder cover.
2	1110	1316	1 - SS 5 - CO	710	Section 5, 14m; under debris in pool.
3	1120	1310	5 - CO	--	Section 6; 5m pool under sunken log; school of adult salmon present.

This form is used to record fish caught during Level Three, Four, or Five Surveys.



## FISH SAMPLING FORM

Stream Name East Fork of Red ADF&G Catalog No. 106-41-30 Date 8/28/82  
Lake Outlet  
 Identify Survey Area "B-2" Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1005	1106	1 CT	61	Section 2, 15m in pool.
2	1018	1103	1 SS	45	Section 2, 81m in pool under debris.
3	1020	1100	0	--	Section 2, 73m in pool along rocks.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## FISH SAMPLING FORM

Stream Name East Fork of Red Lake Outlet ADF&G Catalog No. 106-41-30 Date 8/28/82  
Identify Survey Area "B-3" Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1255	1550	0	--	Section 2, 93m.
2	1300	1552	1 - SS	70	Section 2, 37m.
3	1305	1555	1 - CT 1 - CT	90	Section 1, 94m.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Lake - Survey Area C ADF&G Catalog No. \_\_\_\_\_

1. Section No.	1	2						
2. Compass Bearing	--	--						
3. Gradient	0.5	1.0est						
4. Temperature: Air	12.5	12.5						
Water	10.5	10.5						
5. Water qual: a. color	1	1						
b. turbidity	1	1						
c. pH	7.5	7.5						
6. Streambottom Substrate	1	--	--					
	2	--	--					
	3	--	--					
	4	20	40					
	5	50	60					
	6	30	--					
	7	--	--					
7. ASA a. percent	--	10						
b. quality	--	1						
8. Water Width a. channel	5	3						
b. water	5	1.5						
c. floodplain	2	2						
9. Stream Pools a. percent	80	25						
b. category	SS	SS						
10. Rearing Area	70	50						
11. Debris Loading	10	30						
12. Potential Barriers	N	N						
13. Enhancement/Rehab	N	N						
14. Streambank Veg.	2,3,5	1-5						
15. Upper Bank a. Left	<5	<5						
b. Right	<5	<5						
b. indic Left	N	N						
Right	N	N						
c. veg Left	N	N						
Right	N	N						
16. Lower Bank Left	GS	GS						
Right	U	SS						
17. Stab rating Left	1(1)	1(1)						
Right	1(1)	1(1)						
18. Stream Canopy Cover	3	3						
19. Fish Species juvenile CT	--	1						
bearkill RS	1	--						
20. Sampling								
21. Comments								

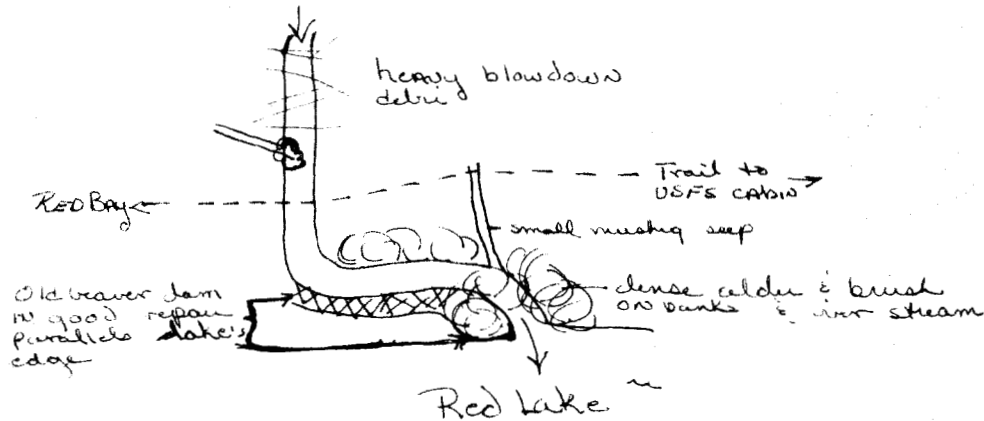
Section 1: 0m; Survey begun at lake's edge. Only one bear killed sockeye salmon was observed near stream mouth. This small stream is characterized by less than 3.0 cfs flows, copious fines throughout the survey, abundant debris in the form of blowdown, dense overhanging vegetation, and an old blown-out beaver dam at the mouth (see diagram). One juvenile resident trout was observed

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

near the Red Lake cabin trail crossing. Isolated pockets of heavily silted ASA were observed in Section 2. Above survey end, stream becomes "seepy riparian" in nature with no identifiable fisheries value.

Survey Area "C"



NOT DRAWN to scale

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Lake Survey Area D ADF&G Catalog No. \_\_\_\_\_

1. Section No.		1	2	3				
2. Compass Bearing		357	77	20				
3. Gradient		2	3	~8				
4. Temperature: Air		12.5	12.5	12.5				
	Water	10	10	10				
5. Water qual:	a. color	1	1	1				
	b. turbidity	1	1	1				
	c. pH	7.5	7.5	7.5				
6. Streambottom	Substrate	1	--	8	40			
		2	--	17	33			
		3	50	40	11			
		4	40	30	8			
		5	5	3	--			
		6	--	--	--			
		7	b) 2	c) 3	a) 1 b) 1			
7. ASA	a. percent	70	50	--				
	b. quality	1	1	--				
8. Water Width	a. channel	5.5	3.7	2.1				
	b. water	5.5	2.3	2				
	c. floodplain	2	2	2				
9. Stream Pools	a. percent	40	15	15				
	b. category	SS	SS	SF				
10. Rearing Area		70	40	15				
11. Debris Loading		8	6	3				
12. Potential Barriers		N	N	N				
13. Enhancement/Rehab		N	N	N				
14. Streambank Veg.		2,3,5	1,3,5	1-5				
15. Upper Bank	a. Left	0	2	9				
	b. Right	0	5	16				
	b. indic							
	Left	N	N	N				
	Right	N	N	N				
	c. veg							
	Left	N	N	N				
	Right	N	N	N				
16. Lower Bank	Left	U	U	U				
	Right	U	U	GS				
17. Stab rating	Left	1(1)	1(1)	1(1)				
	Right	1(1)	1(1)	1(2)				
18. Stream Canopy Cover		3	1	1				
19. Fish Species	CT	--	2	--				
	DV	3	3	--				
	adults							
	live RS	<12	20					
	mort RS	25	12					
20. Sampling		Y	Y	N				
21. Comments								

Section 1: 0m; Survey begun at lake's edge with USFS recreational cabin on right bank of stream.  
 26-38m; Stream flows under living root systems on left bank.  
 69m; Seep on left bank.  
 ASA in Section is primarily for RS, other species 35%.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 25m; Tributary converges on left side; some rearing area; no ASA; 10°C water temperature; less than 1 cfs flow; shallow riffles between pools.  
72m; Change in substrate to primarily large cobble/boulders and gradient increase to 3.5%. No adult RS observed beyond this point.  
ASA is primarily for RS, 40% for other species.

Section 3: 6.5m; .5 meter vertical waterfall into SF pool.  
76m; Small hillside seep converges on left; 11°C water temperature.  
Stream habitat change occurs in this section with +7% gradient and primarily bedrock/boulder substrate. Resident fish rearing, NO spawning or anadromous fish rearing area.

Five meters above Section 3, the stream enters a narrow (5m wide) V-notch with vertical bedrock walls and a stream gradient of 10 to 11%. Substrate is 50% boulders. A 2 meter barrier falls through a bedrock chute into a small, 1m deep pool occurs 29m above Section 3. Reconnaissance above falls revealed increasing gradients (10 to 15%) over 90% bedrock substrate. 1m vertical waterfalls over debris and rock faces are frequent. No fish habitat observed.

# FISH SAMPLING FORM

Stream Name Red Lake ADF&G Catalog No. 106-41-30 Date 9/14/82

Identify Survey Area D Water Temp. 11°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1135	1300	1 - CO 1 - SB	--	Section 1, 22m along left bank under a root wad.
2	1210	1250	3 - SS	72mm 60mm 52mm	Section 2, 70m along right bank under undercut bank.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Lake Survey Area E ADF&G Catalog No. \_\_\_\_\_

1. Section No.	1	2						
2. Compass Bearing	59	41						
3. Gradient	>12	~9						
4. Temperature: Air	10	10						
Water	9	9						
5. Water qual: a. color	1	1						
b. turbidity	1	1						
c. pH	8	8						
6. Streambottom Substrate	1	45	--	Unable to determine substrate in Section 2 due to heavy moss growth covering streambed, though substrate appeared to be primarily boulder.				
	2	10	--					
	3	5	--					
	4	20	--					
	5	15	--					
	6	--	--					
	7	c) 5	--					
7. ASA a. percent	10	--						
b. quality	1	--						
8. Water Width a. channel	9.8	5						
b. water	9.8	3						
c. floodplain	2	2						
9. Stream Pools a. percent	40	5						
b. category	SS/DS	SF						
10. Rearing Area	35	--						
11. Debris Loading	12	7						
12. Potential Barriers	N	N						
13. Enhancement/Rehab	N	N						
14. Streambank Veg.	3,5	1,3,5						
15. Upper Bank a. Left	0	12						
b. Right	4	10						
b. indic Left	N	N						
Right	N	N						
c. veg Left	N	N						
Right	N	N						
16. Lower Bank Left	GS	U						
Right	U	U						
17. Stab rating Left	1(1)	1(1)						
Right	1(1)	1(1)						
18. Stream Canopy Cover	3	2						
19. Fish Species adult RS	60	--						
20. Sampling	N	N						

21. Comments

Section 1: 0m; Survey begun at lake's edge. Approximately 30 RS observed milling at mouth of stream. Habitat was pools, gravel and sand substrate and decaying vegetable matter for first 40 meters.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

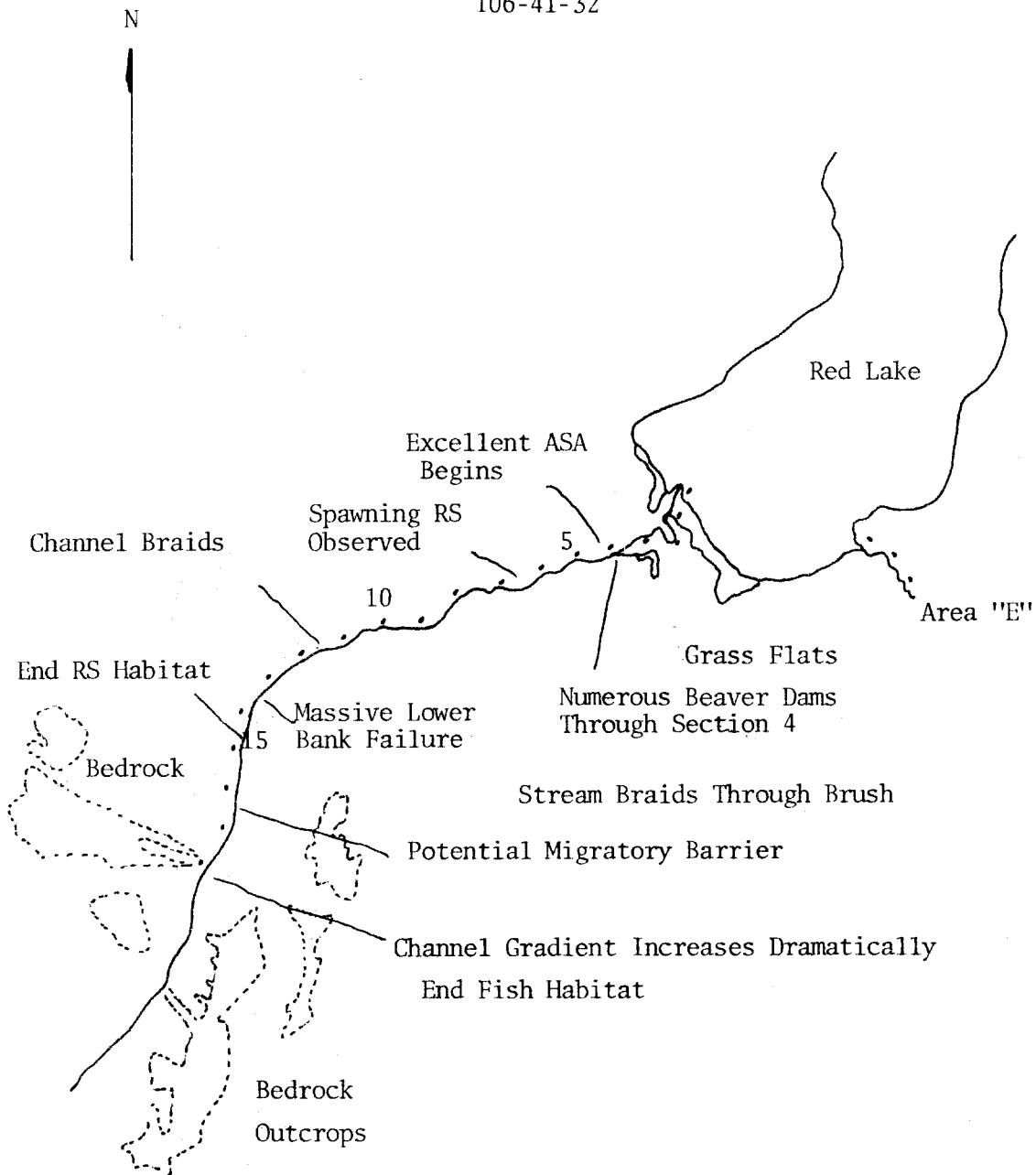
Section 1: 42m; A small side channel diverges on the left side, flowing over moss covered rocks (diverges at Section 1, 81m).  
45m; Beginning of steep cascades/falls over boulders/large cobble substrate with dense moss cover on rocks. No RS seen above this point. End of fish habitat.

Section 2: 50m; Stream forks; left fork flows under living root systems and debris to lake's edge via a separate channel.  
No fish habitat observed.

# PEAK ESCAPEMENT RECORD

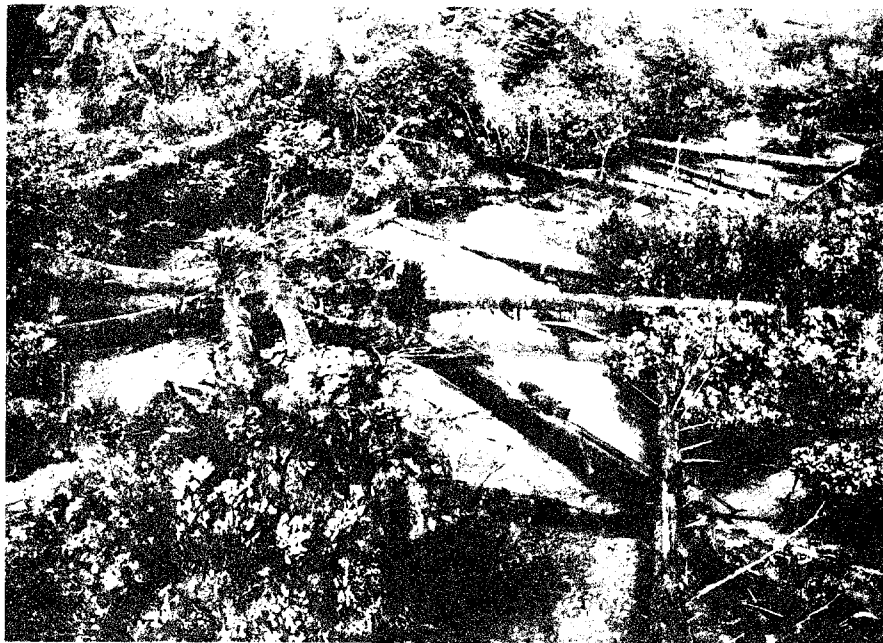
Red Lake Outlet  
106-41-30

DATE	PINK	CHUM	OTHER SPECIES	REMARKS
8/30/60	300	0	3,500 - RS	
8/12/61	0	0	3,000 - RS	
8/31/62	0	0	1,200 - RS	
9/10/63	0	0	2,300 - RS	
9/4/64	3	0	5,700 - RS	
7/21/65	0	0	1,000 - RS	
1968	None Seen on Survey			
6/25/69	0	0	50 - RS	
9/13/70	50	0	0	
6/21/71	0	0	3 - RS	
9/22/71	300	0	-	
1972	None Seen on Survey			
8/30/74	0	0	85 - RS	
8/26/75	565	24	768 - RS	
1976	None Seen on Survey			
7/27/77	2,000	0		
7/10/78	0	0	200 - RS	
8/22/78	700	0		
7/03/79	0	0	400 - RS	
8/08/79	20	0		
8/26/80	0	0	2,426 - RS	
9/11/80	0	4		
9/02/81	0	0	500 - RS	





1. Area "F": Confluence of Area "F" and Red Lake. Beaver dams and "backed-up" flow result in extensive pooling. Note .5 x 15 m active beaver dam, center left.



2. Section 4-7: Nearly continuous gravel riffles negotiate an extensive brushy floodplain amidst heavy blowdown and debris.



3. Section 9: Gradient and substrate size increasing, however, ASA remains common. A small, sinuous tributary enters the main stem, upper right.



4. Section 15: Massive, left lower bank failure demarcates end of fish habitat. Steep gradients and coarse substrate typify channel above this point.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Lake Survey Area F ADF&G Catalog No. 106-41- 32

Head of Red Lake Inlet Stream

1. Section No.		1	2	3	4	5	6	7	8
2. Compass Bearing		103	163	215	138	168	166	165	141
3. Gradient		1.0	1.5	2	2	2	2.5	3	3
4. Temperature: Air		11.5	11.5	11.5	11.5	11.5	11.5	12	12
	Water	9.5	9.5	9	9	9	9	9	9
5. Water qual:	a. color	1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	8	8	8	8	8	8	8	8
6. Streambottom	Substrate	1	--	--	--	--	--	--	--
		2	--	--	--	--	--	10	26
		3	15	15	40	50	65	70	45
		4	25	23	40	35	27	26	25
		5	58	60	17	12	5	2	1
		6	--	--	--	--	--	--	--
		7	b) 2	b) 2	b) 3	b) 3	b) 3	b) 2	b) 2
7. ASA	a. percent	15	15	35	45	65	75	75	40
	b. quality	1	1	1	1	1	1	1	1
8. Water Width	a. channel	12	25	7.6	9.2	8.6	29.5	11	11
	b. water	12	25	7.6	9.2	8.6	29.5	3/5	6.4
	c. floodplain	3	3	1	3	3	3	3	3
9. Stream Pools	a. percent	75	20	25	22	20	18	18	20
	b. category	DS	DF	DF	SF/DS	DF/SF	SF/DF	DF/SF	DF/SF
10. Rearing Area		75	70	25	20	18	15	15	20
11. Debris Loading		5	18	25	18	18	9	12	15
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1,5	1-5	1-3,5	1-3,5	1,3,5	1,3,5	1,3,5	1-3,5
15. Upper Bank	a. Left	0	<5	12	12	<5	5	8	15
	b. Right	0	<5	10	5	5	<5	<5	<5
	b. indic								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	SS	SS	U	GS	U	U	U	GS
	Right	SS	U	U	U	GS	GS	U	GS
17. Stab rating	Left	1(1)	1(1)	1(2)	1(1)	1(1)	1(1)	1(1)	1(2)
	Right	1(1)	1(1)	1(1)	1(1)	1(1)	1(2)	1(1)	1(1)
18. Stream Canopy Cover		3	3	3	3	3	3	3	3
19. Fish Species	juveniles	SS	--	76	712	--	--	--	--
	CT	--	--	--	1	--	--	--	--
	DV	--	--	--	2	--	--	--	--
	adults	DV	--	7150	--	--	--	--	--
	RS	--	--	200+	500+	500+	500+	300+	180
20. Sampling		N	N	N	N	N	N	N	N
21. Comments									

Section 0: 15m below Section 1 is the top of the first dam on stream, 63m above the beginning of the right bank at the lake's edge.

Section 1: 65m; Small beaver dam, .25m high.

74m; Tributary converges on right flowing out of a beaver dam approximately 40m upstream (see diagram).

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 11m; A .6m high recently constructed beaver dam impounds a .6m deep, heavily silted reservoir.

Section 3: 40m; Channel diverges on right and is typically narrow with deep fast flow.

Section 4: 68m; A recently constructed blown out beaver dam crosses the main stem.

Section 5: Excellent gravel riffles traverse an extensive flood plain colonized by dense salmon/blueberry and current bushes. Snags, blow-down, instream logs and overhanging vegetation common.

Section 6: Nearly continuous gravel riffles negotiate an extensive brushy floodplain amidst heavy blowdown and debris.

Section 7: 44m; Red salmon observed spawning in gravel/cobble riffle. Channel diverges under heavy debris on right side.

Roosting seagulls were common throughout Sections 1 - 7.

Section 8: 25m; .5m high "falls" over instream log.  
41-71m; Extensive stream braiding through dense brush along right bank, main flow left.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Lake Survey Area F ADF&G Catalog No. 106-41- 32

1. Section No.		9	10	11	12	13	14	15	16
2. Compass Bearing		179	175	176	147	145	124	100	107
3. Gradient		4	4	4	~4	~4.5	~5	~7	~7
4. Temperature: Air		14	14	14	14	14	14	14	14
	Water	9	9	9	9	9	9	9	9
5. Water qual:	a. color	1	1	1	1	1	1	1	1
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	8	8	8	8	8	8	8	8
6. Streambottom Substrate	1	17	17	22	27	30	35	35	45
	2	24	30	30	30	30	30	30	30
	3	30	30	25	25	25	25	25	15
	4	20	20	20	15	15	10	7	7
	5	3	1	1	--	--	--	--	--
	6	--	--	--	--	--	--	--	--
	7	a) 3 b) 3	b) 2	b) 2	b) 3	--	--	b) 3	b) 3
7. ASA	a. percent	15	15	15	--	--	--	--	--
	b. quality	1	1	1	--	--	--	--	--
8. Water Width	a. channel	10.5	9	9.4	9.2	20	11.3	19	6.2
	b. water	5.5	9	3.9	6	18.5	9.8	14	5.5
	c. floodplain	3	1	2	2	3	2	1	2
9. Stream Pools	a. percent	15	15	15	12	15	10	10	10
	b. category	DF/DS	DF/SF	DF/SF	DF/SF	DF/SF	SF/DS	DF	DF
10. Rearing Area		10	10	10	6	7	5	5	5
11. Debris Loading		15	18	7	9	5	9	15	9
12. Potential Barriers		N	N	N	N	N	N	Y	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-5	1,3,5	1-5	1-3,5	1,3,5	1,3,5	1-5	1-5
15. Upper Bank	a. Left	22	30	26	23	19	18	42	28
	b. Right	5	5	8	5	5	15	9	9
	b. indic								
	Left	N	N	N	N	N	N	*	*
	Right	N	N	N	N	N	N	N	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	GS	U	GS	GS	U	GS	U	GS
	Right	U	GS	GS	GS	U	U	GS	U
17. Stab rating	Left	1(2)	1(1)	1(1)	1(2)	1(1)	2(1)	3(2)	1(2)
	Right	1(2)	1(2)	1(2)	1(2)	2(1)	1(1)	1(1)	1(1)
18. Stream Canopy Cover		3	3	3	2	3	3	3	2
19. Fish Species	juveniles	SS	--	--	--	--	--	--	--
	"	CT	--	--	--	--	--	--	--
	"	DV	--	--	--	--	--	--	--
	adults	DV	--	--	--	--	--	--	--
	RS	150	75	130	75	60	12	3	--
20. Sampling		N	N	N	N	N	N	N	N
21. Comments	*Steep Slope								

Section 9: 0m; Exposed rock face on left, approximately 150m above stream edge. 53m; Tributary converges on right side; reconnoitered 60m upstream; observed no fish; 3.5 cfs flow; 7.0 pH; 9°C water temperature.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 10: 46m; .5 meter waterfall over sunken log into a deep pool below.

Section has moderate gradient and several cobble riffles.

Section 11: 53m; Tributary converges on right with 4.5m wide channel, 3.5 cfs flow, (a possible side channel?); 7.0 pH, 9°C water temperature.

69m; Dry flood channel diverges on left; 10m wide.

Section 12: 67m; Beginning of 64 meters of stream braiding with several .6-.8 meter falls over sunken logs and 10-15m cascades over 3% gradient and boulder/cobble substrate.

Section 14: Channel forks for 100m with 90% of flow in left channel bordering a massive lower bank failure.

63-78m; Bedrock/boulder chutes on right side.

63-100m; Heavy debris/blowdown across stream.

Section 15: 2-24m; Blowdown fallen from SW (216°) wind direction; 12-15m high landslide on left bank; recent occurrence.

34m; End of heavy log debris from landslide along left bank.

83m; End of spawning red salmon. A possible migration barrier during low water flow periods (during high water flows there exists a side channel on right which was dry at the time of this survey).

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Lake Survey Area F ADF&G Catalog No. 106-41-32

1. Section No.		17	18						
2. Compass Bearing		101	134						
3. Gradient		~ 7	~ 8						
4. Temperature: Air		14	14						
	Water	9	9						
5. Water qual:	a. color	1	1						
	b. turbidity	1	1						
	c. pH	8	8						
6. Streambottom Substrate	1	40	30						
	2	30	25						
	3	15	15						
	4	5	10						
	5	--	--						
	6	--	--						
	7	a) 5 b) 5	a) 5 b) 5						
7. ASA	a. percent	--	--						
	b. quality	--	--						
8. Water Width	a. channel	19	9.8						
	b. water	10	9.8						
	c. floodplain	1	2						
9. Stream Pools	a. percent	10	10						
	b. category	DF	DF						
10. Rearing Area		--	--						
11. Debris Loading		18	20						
12. Potential Barriers		Y	N						
13. Enhancement/Rehab		N	N						
14. Streambank Veg.		1,3,5	1-5						
15. Upper Bank	a. Left	34	37						
	b. Right	25	26						
	b. indic Left	V-not	V-not						
	Right	V-not	V-not						
	c. veg Left	N	N						
	Right	N	N						
16. Lower Bank	Left	U	GS						
	Right	GS	U						
17. Stab rating	Left	3(2)	1(2)						
	Right	1(2)	1(1)						
18. Stream Canopy Cover		2	3						
19. Fish Species	juvenile SS	--	--						
	" CT	--	--						
	" DV	--	--						
	adult DV	--	--						
	" RS	--	--						
20. Sampling		N	N						
21. Comments									

Section 17: A potential barrier to fish; 1-1.2 meter debris jams in natural cascades with no holding area.  
56m; Dry side channel diverges on left (5 to 6 meter wide channel).

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 18: 100m; Ephemeral tributary converges on right from rock face which is approximately 100 meters from main stream edge. Tributary flow is 2.5 cfs over +10% stream gradient. Heavy blowdown from steep V-notched upper banks through entire section.

Section 16-18: Steeply sloping upper banks are covered with mature conifers with a fairly open understory of huckleberry brush. Steep stream gradient over cobble/boulder substrate.

Survey ended in a V-notch "tongue" of mountainside visible from channel on the right bank. Bedrock cirque is visible above us. Steep gradient (approximately 10%) over a boulder/large cobble substrate lacked fish habitat. No adult or juvenile fish sighted in the near continuous cascades.

# LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

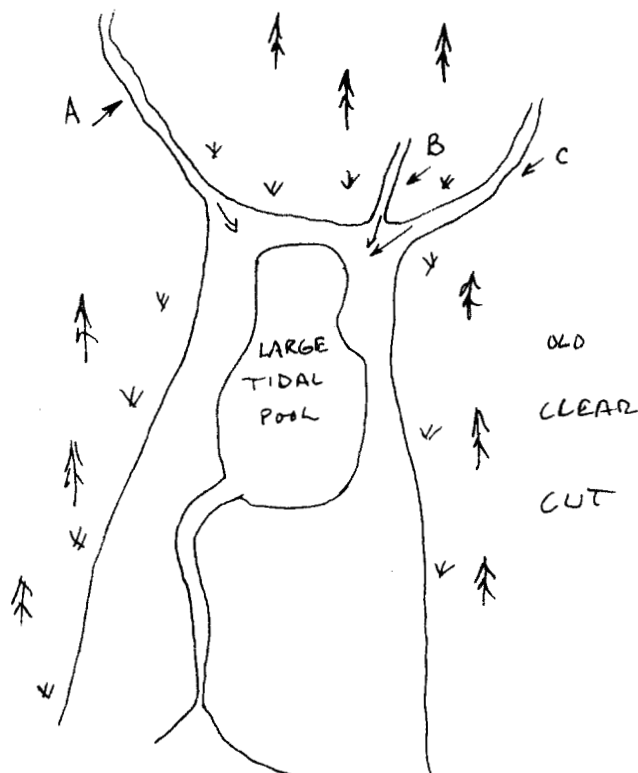
Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Short Creek 3. Lat. 56°16'05"
2. ADI&G Catalog No. 106-41-29 3. Long. 133°19'35"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-8-105 71-17-9-27
8. Bay/Drainage Red Bay 9. Access 1 - 6 10. Camping 4
11. Present Land Use a. Road above creek sources 11b. None
12. Historical Land Use Logging in Red Bay area
13. Stream Origin 3 4 5 6 14. Flow Stage 1
15. Flow method, width, depth, length, constant, time estimated, <0.5 cfs  
grid flow
16. Temp. Sensitivity Shallow water depths; low velocity flows.
17. Beaver 5 18. Type aquatic Veg. 4 19. Density Aquatic Veg. 3
20. Adult Salmon N 21. Intertidal a. gradient 2%
- b. bottom type % fines 70 % c. ASA 0
- gravel small cobble 25 % d. schooling N
- large cobble/boulders/bedrock 5 % e. shellfish N
- f. Small boat anchorage off point on right side of entrance to cove.
22. Comments
  2. Lower Intertidal Zone: No distinct channel; mostly intergravel flows; <1 cfs; grass covered lower banks; undercut; No ASA.
  - Upper Intertidal Zone: Large tidal pool with muck substrate; Fucus sp. No ASA. No fish habitat. At head of cove, 3 small streams flow into tidal pool from right and left sides.
  3. "Short Creek" was found to be 3 small streams at the head of the cove which converge, forming a large tidal pool (see diagram).
23. Investigators Murph/Mickowski
24. Date 8/26/82 25. Time 1425 1500 26. Weather 1, 5  
start end
27. Photos \_\_\_\_\_

R-10 2600-3a (1/81)

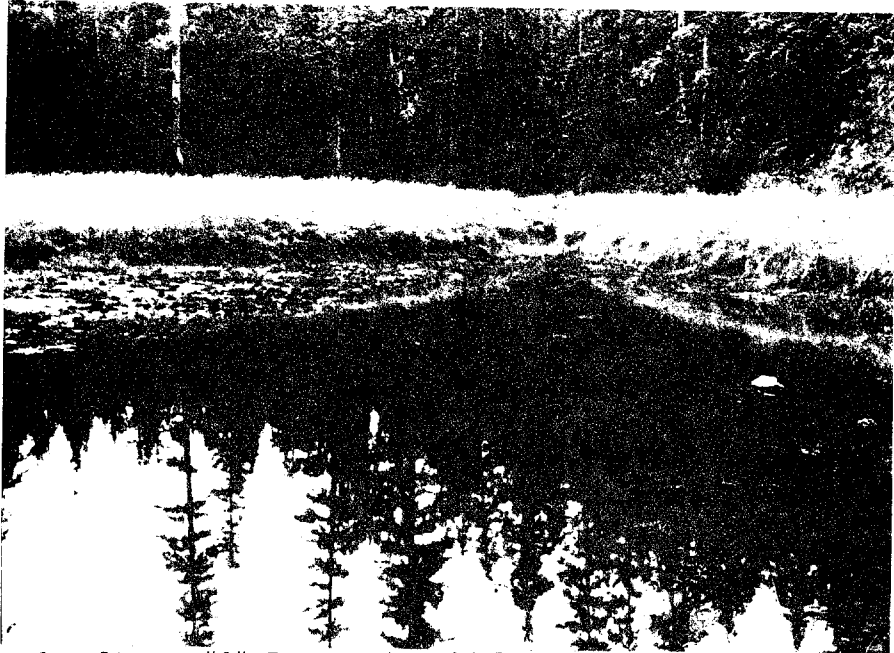


Stream "A": Less than .5 cfs; 13°C water temperature; pH 7.0. This small stream drains an extensive "mucky" riparian wetland with dense in-stream vegetation and is characterized by less than 1.0m channel widths, 5-8cm water depths, and steeply sloping, undercut banks. The first 35m, however, contains gravel/cobble substrate and short cobble/boulder cascades. No fish or habitat observed.

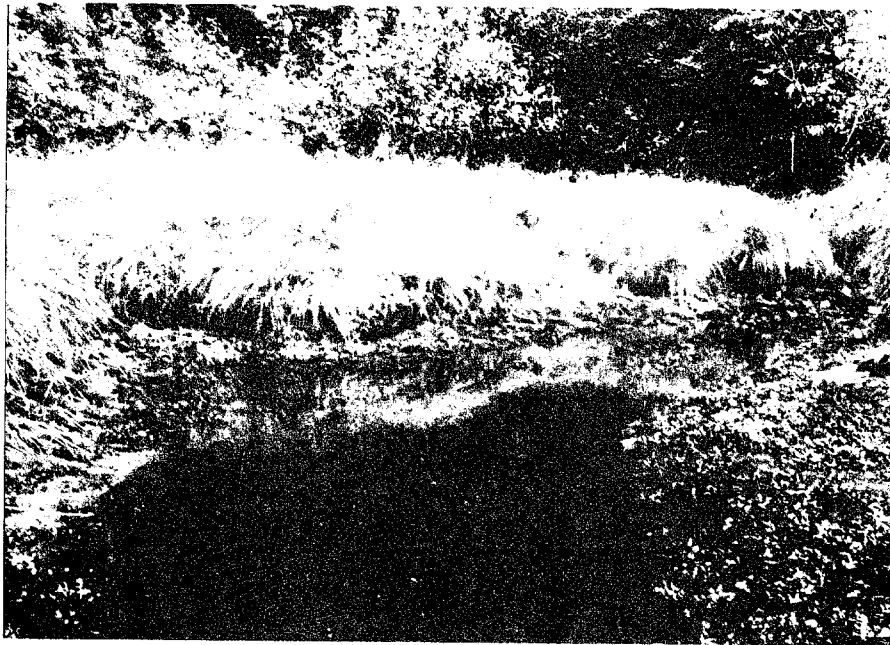
Stream "B": Less than .5cfs; 13°C water temperature; pH 7.5. This small stream drains a "mucky" riparian wetland before disappearing under root systems and moss, and is characterized by a less than .5m wide channel. The intertidal ecotone is delineated by a substrate drop of 1.5 vertical meters. No fish or habitat observed.

Stream "C": Less than 1.0cfs; 11.5°C water temperature; pH 7.5. This small stream enters "treeline" 22m above confluence with stream "B", disappearing under root wads and moss at 42m, and is characterized by a 6%, .8m wide channel of cobble, boulders, and gravel. Fines and in-stream skunk cabbage is copious. No fish or habitat observed.

Short Creek  
106-41-29



1. Stream "A" Enters the Tidal Pool From the Cove's Left Bank.



2. Stream "B" & "C" Converge on the Tidal Pool From the Cove's Right Bank.

LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Narrow Creek and Red Bay #9 3. Lat. 56°16'15"
2. ADF&G Catalog No. 106-41-28 3. Long. 133°19'25"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-8-104
8. Bay/Drainage Red Bay 9. Access 1 to 6 10. Camping 4
11. Present Land Use a. None observed 11b. deer/bear trails
12. Historical Land Use None observed
13. Stream Origin 4 5 6 14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, <1 cfs  
grid flow
16. Temp. Sensitivity Muskeg source, low velocity flow, low water depth
17. Beaver 5 18. Type aquatic Veg. 1 19. Density Aquatic Veg. 2
20. Adult Salmon N 21. Intertidal a. gradient 1.5%
- b. bottom type % fines 40 % c. ASA 0
- gravel small cobble 40 % d. schooling N
- large cobble/boulders/bedrock 20 % e. shellfish y
- f. Small boat anchorage off right point of cove.
22. Comments
  1. Above intertidal zone the stream flows from the left side of the head of the cove with a 1-1.5m wide channel (no distinct channel in intertidal zone) and cobble/boulder/bedrock substrate for the first 100m; heavy debris (15-20% loads) in and over channel; gradient is +10% in a V-notch; the channel is heavily silted with dense moss growth on rocks; several .2-.6m waterfalls over boulders. Approximately 100m above intertidal zone the stream leaves V-notch and enters a large open muskeg in a slough-like channel with .5=.6m high, steeply sloping lower banks fed by small muskeg seeps; pH; 7.8; water temperature 13.5°C; compass bearing; 88° (taken at top of intertidal zone).
23. Investigators Murph/Mickowski
24. Date 8 / 26 / 82 25. Time 1510 1530 26. Weather 1, 3  
start end
27. Photos

R-10 2600-3a (1/81)

## LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A, B 2. Equipment X  
3. Historical Fish Species PS  
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Salmon Creek & "Red Bay Head SE Arm" 3. Lat. 56°16'35"  
2. ADF&G Catalog No. 106-41-27 3. Long. 133°18'05"  
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4  
7. Aerial Photo No. 71-18-104  
8. Bay/Drainage Red Bay 9. Access 2, 4, 5, 7 10. Camping 4  
11. Present Land Use a. current logging activity 11b. bear/deer trails  
12. Historical Land Use 1970's logging unit along left bank  
13. Stream Origin 3 4 5 6 14. Flow Stage 1  
15. Flow \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, estimated: \_\_\_\_\_, 3 cfs  
method width depth length constant time grid flow  
16. Temp. Sensitivity No canopy, low velocity, low water level  
17. Beaver 5 18. Type aquatic Veg. 1 19. Density Aquatic Veg. 3  
20. Adult Salmon Y 21. Intertidal a. gradient 1.0  
b. bottom type % fines 20 % c. ASA 70  
gravel small cobble 40 % d. schooling Y  
large cobble/boulders/bedrock 20 % e. shellfish N  
f. Large boat anchorage along left shore of Red Bay; small boat anchorage  
22. Comments anywhere offshore in bay.  
1. Tide high at 1140 hours.  
2. 20. Pink salmon jumping in Red Bay.  
21c. Fair PS ASA in intertidal zone.  
21d. Schooling areas in Red Bay in front of intertidal zone.  
3. USFS Tag: "DV spawning and rearing, possible searun DV 8/79" Flagged blue/white.  
4. Reach Evaluation: The stream meanders through a clearcut unit with 3-5% slopes and heavily silted cobble/gravel substrate. Debris concentrations of approximately 30%. Heavy brush. >10 DV observed and 2 SS trapped. The tributary surveyed has very steep gradients and cascades. Very limited rearing and no ASA. 1 DV observed. The tributary flows through a (over)  
23. Investigators Murph & Mickowski  
24. Date 8 /15 /82 25. Time 1210 1640 26. Weather 3  
start end  
27. Photos

R-10 2600-3a (1/81)



Salmon Creek  
106-41-27

22. Comments Cont.

buffer strip for the first 67m, then enters a cutting unit for the rest of the survey. Heavy logging debris in stream channel.

Crabapple trees with green, immature fruit and trailing raspberries abundant in area. Much of buffer strip is being or has been blown down.



1982 CLEAR CUT

106-11-901

ROAD

RED BAY



1. Intertidal Looking up Channel to Buffer Strip.  
No Appreciable Intertidal Spawning Potential.



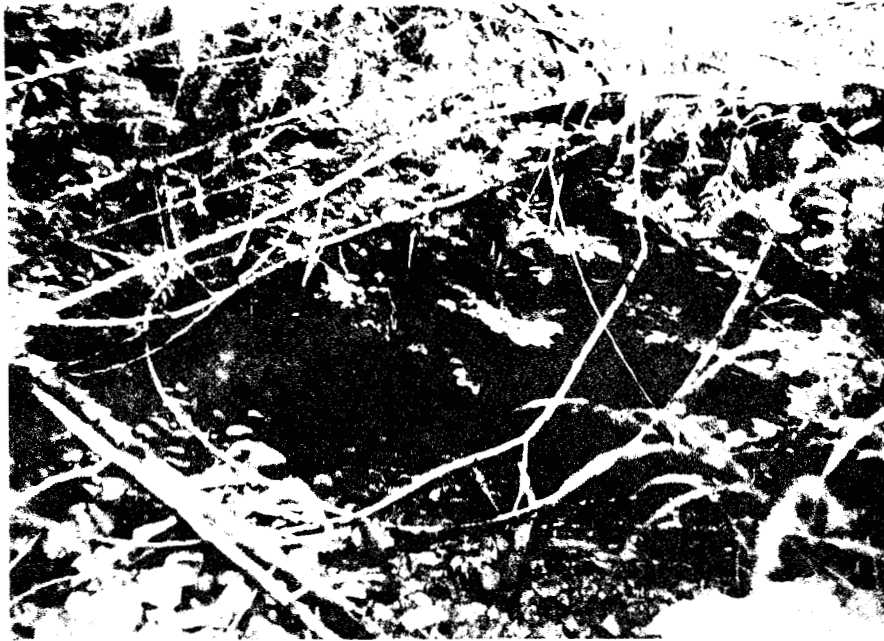
2. Section 2: Cobble Riffle Section; Patchy ASA.  
Heavy Brush Both Banks.



3. Section 3: Heavy Debris has Induced Frequent Channel Migration.



4. Looking Upstream Beyond End of Survey. Gradient Rapidly Increases, and Debris Loading Approaches 100%.



5. Section 11: Mouth of Left Fork.



6. Left Fork Section 2: Steep Gradients  
Primarily Boulder/Bedrock Substrate, and  
Heavy Debris Loading. No Spawning or  
Rearing Potential.

Salmon Creek  
106-41-27

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Area A									
1	100	8	1	8.0					
2	100	0.35	10	3.5					
3	100	1	10	10					
Total				21.5m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Salmon Creek

ADF&G Catalog No. 106-41-27

		Survey Area A (Main Stem)					Survey Area B	
1. Section No.		11	2	3			1	2
2. Compass Bearing		126	142	111			8	55
3. Gradient		1.5	6	10	Estimated due to		20	30
4. Temperature: Air		12.5	12.5	12.5	heavy debris and		16	16
	Water	12.5	12.5	12.5	brush.		11	11
5. Water qual:	a. color	1	1	1			1	1
	b. turbidity	1	1	1			1	1
	c. pH	--	8	8			8	8
6. Streambottom Substrate	1	10	15	5			20	25
	2	30	30	20			25	20
	3	25	20	35			30	15
	4	20	15	25			15	15
	5	15	17	15			10	10
	6	--	--	--			--	--
	7	--	a) 1	--			--	a) 15
7. ASA	a. percent	1.0	10	10	Could be increased		--	--
	b. quality	2	2	2	by factor of X2		--	--
8. Water Width	a. channel	8	1.5	2.3	before 1982 logging		2.65	1.5
	b. water	8	.35	1.0	activity.		.65	.5
	c. floodplain	3	2	2			3	1
9. Stream Pools	a. percent	5	25	20			5	--
	b. category	SS	SS	SS			SS	--
10. Rearing Area		5	20	15			5	--
11. Debris Loading		3	30	25			35	25
12. Potential Barriers		N	N	N			N	N
13. Enhancement/Rehab		N	N	N			N	N
14. Streambank Veg.		5	3,4,5	3,4,5			1-5	3,5
15. Upper Bank	a. Left	0	20	1			0	17
	b. Right	0	13	17			0	13
	b. indic							
	Left	N	N	N			N	N
	Right	N	N	N			N	N
	c. veg							
	Left	N	N	N			N	N
	Right	N	N	N			N	N
16. Lower Bank	Left	GS	SS	GS			GS	U
	Right	GS	U	U			U	GS
17. Stab rating	Left	1(2)	1(3)	1(1)			1(2)	1(1)
	Right	1(2)	1(1)	3(1)			1(1)	1(1)
18. Stream Canopy Cover		3	3	3			3	3
19. Fish Species	SS	2	--	--			--	--
	CT	--	--	--			--	--
	DV	<10	--	>6			1	--
20. Sampling		Y	N	N			N	N
21. Comments	<p>Intertidal Zone: Dense <u>Enteromorpha</u> sp. on rocks. Sedge beach grasses on banks. Section 11 begun at edge of grass.</p> <p>Section 11: 48m; Stream enters treed buffer strip on right bank. End ITZ.</p> <p>68m; Stream enters treed buffer strip on left bank.</p>							

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

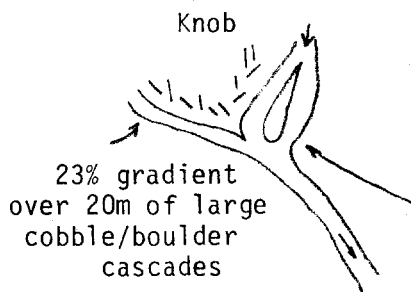
21. Comments Cont.

Section 11: 78m; End of buffer strip. Tributary "A" enters on right side under large fallen alder tree. Main stem enters muskeg/clearcut area.  
90m; Trap #1 set - 2 SS caught; time: 1226-1250.

Section 2: 89m; Debris dam.

Section 3: 16m; Debris dam; .6m cascade over debris and moss.  
31-41m; A large midchannel root wad is causing a possible barrier to fish migration. Stream flows under and over heavy debris (moss covered and bushy debris) from a large DS impounded pool (NOT a beaver dam); more than 6 DV observed in pool; possible rehabilitation project.  
81m; Debris and heavy slash over stream.  
100m; 2' vertical falls over sunken log with no jumping pool below and depths of 5.0-8.0cm of water.  
END SURVEY.

Walking above Section 3, approximately 50m, the stream gradient is about 14%. The main stem branches into 3 channels of approximately equal flow.



flow over clay banks, .5m vertical drop to stream. 10% gradient.

Survey Area B: Section 1: Begins at mouth under heavy debris. The stream flows inside buffer strip for 67m before entering clearcut. A recently blown down alder tree was in first 27m of stream channel.

Section 2: Is very steep with cascades and .3-.6m falls over bedrock/boulders. No ASA.  
END SURVEY.



## FISH SAMPLING FORM

Stream Name Salmon Creek ADF&G Catalog No. 106-41-27 Date 8/15/82

Identify Survey Area A Water Temp. 12.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1226	1250	2 - SS	101 71	Section 1 in right fork of stream.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# PEAK ESCAPEMENT RECORD

Salmon Creek  
106-41-27

DATE	PINK	CHUM	OTHER SPECIES	REMARKS
7-26-77	300			
7-24-78	750			
8-08-79	450			
7-26-77	300			
7-24-78	750			
8-08-79	450			

Date: 10/29/82

FISHERIES REHABILITATION AND/OR ENHANCEMENT  
NEW PROJECT OPPORTUNITY FORM

1. WHAT (give a brief description):

Heavy debris and slash left from logging activity on both sides of stream.

2. WHERE (be specific):

Salmon Creek (106-41-27); 200-400m above the mouth, in the Southeast Arm of Red Bay.

3. BENEFITS:

Prevent further stream channel migration. This migration induces siltation and lower bank failures which is detrimental to downstream ASA.

4. SUBMITTED BY (name, address, telephone, etc.):

Laura Murph and Ted Mickowski  
ADF&G  
Box 667  
Petersburg, Alaska 99833  
  
Phone 907-772-3801

LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

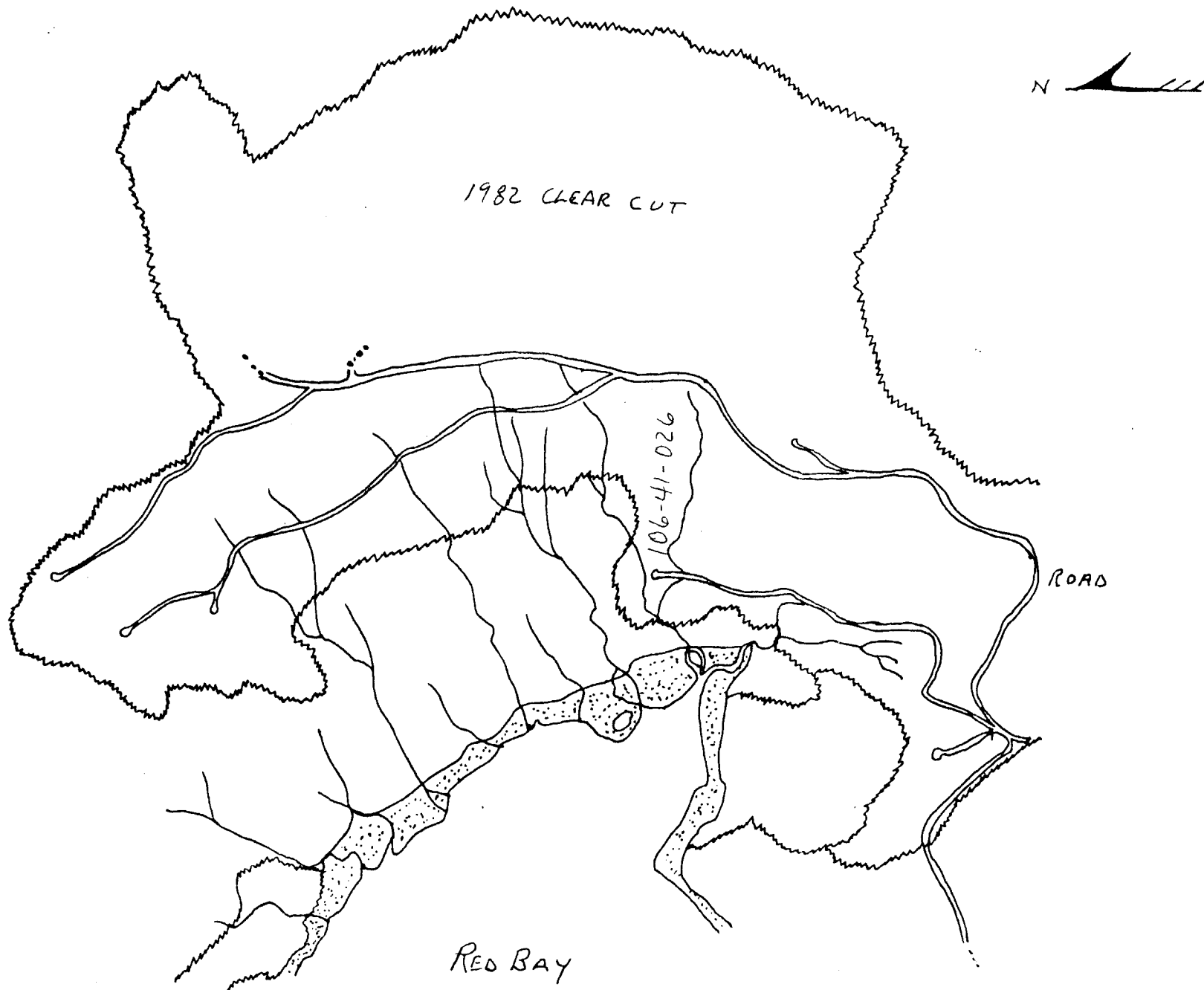
Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Creek No. 4 and Red Bay #8 3. Lat. 56°16'45"
2. ADF&G Catalog No. 106-41-26 3. Long. 133°18'05"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay 9. Access 2, 4, 5, 6 10. Camping 4
11. Present Land Use a. 1982 Logging Unit 11b. Bear sign; heavy slash from logging activity
12. Historical Land Use 1960's logging in nearby areas
13. Stream Origin 3 5 6 14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, 2 cfs  
grid flow
16. Temp. Sensitivity Low velocity flow; shallow water depth
17. Beaver 5 18. Type aquatic Veg. 1 19. Density Aquatic Veg. 3
20. Adult Salmon N 21. Intertidal a. gradient 2%
- b. bottom type % fines 20% c. ASA 0
- gravel small cobble 40 % d. schooling Y
- large cobble/boulders/bedrock 20% e. shellfish N
- f. Large boat anchorage along right shore of Red Bay; skiff anchorage off stream mouth.
22. Comments
  1. High tide at 1140 hours.
  2. USFS flagged B/W for coho spawning/rearing habitat.
  3. Dense Enteromorpha sp. on rocks of stream in intertidal zone.
  4. A high-lead logging operation occurring at time of this survey. Stream flows through logging unit for all but 103m of channel length (30m in a straight line) above intertidal zone where it is inside a buffer strip of timber. 1 CT & 1 DV observed inside left unit boundary. Stream gradients are 10-14% below road and even greater above road crossing. 10% rearing in debris induced pools. Most of habitat was cascades over large and small cobble.
23. Investigators Murph/Mickowski
24. Date 8/15/82 25. Time 1135 1205 26. Weather 3  
start end
27. Photos

R-10 2600-3a (1/81)





1. Intertidal; Looking up Channel to Buffer Strip.  
No Appreciable Intertidal Spawning Potential.



2. Intertidal Zone Looking West Over Red Bay.  
No Significant Intertidal ASA.



3. Dense Brush Along Section 11. Some Channel Braiding and the Presence of Pioneering Plant Species Indicate Unstable Conditions.



4. Creek No. 4 Looking Downstream Over Blowdown Along the Unit Boundary.

Creek No. 4  
106-41-26

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
11	100	4.3	2	8.6					
2	100	.76	5	3.8					
3	100	.76	2	<u>1.5</u>					
Total				13.9m <sup>2</sup>					



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Creek No. 4 ADF&G Catalog No. 106-41-26

1. Section No.		11	2	3				
2. Compass Bearing		12	23	63				
3. Gradient		5 est	8 est	14 est	Estimated due to debris loading.			
4. Temperature: Air		12	13	13				
	Water	12.5	12.5	12.5				
5. Water qual:	a. color	1	1	1				
	b. turbidity	1	1	1				
	c. pH	8	8	8				
6. Streambottom Substrate	1	10	5	5				
	2	30	25	35				
	3	35	30	40				
	4	15	15	15				
	5	10	20	5				
	6	--	--	--				
	7	--	c) 5	--				
7. ASA	a. percent	2	5	2	ASA estimates were reduced by a factor of two, as a result of heavy fines infiltration.			
	b. quality	2	2	2				
8. Water Width	a. channel	4.3	2.35	3.7				
	b. water	4.3	.8	.8				
	c. floodplain	3	3	2				
9. Stream Pools	a. percent	25	15	5				
	b. category	SS	SS	SF				
10. Rearing Area		20	10	--				
11. Debris Loading		35	35	20				
12. Potential Barriers		N	N	N				
13. Enhancement/Rehab		N	N	N				
14. Streambank Veg.		5	1-5	3,5				
15. Upper Bank	a. Left	0	0	14				
	b. Right	0	0	4				
	b. indic							
	Left	N	N	N				
	Right	N	N	N				
	c. veg							
	Left	N	N	N				
	Right	N	N	N				
16. Lower Bank	Left	GS	GS	U				
	Right	GS	SS	GS				
17. Stab rating	Left	1(2)	2(2)	2(1)				
	Right	1(2)	1(2)	1(2)				
18. Stream Canopy Cover		3	1	3				
19. Fish Species	CT	--	--	--				
	DV	--	--	--				
	SS	--	--	--				
20. Sampling		Y	N	N				
21. Comments								

Section 11: 0m; Begun at edge of beach grass in intertidal zone.  
38m; Entered timber buffer strip. Dense brush.  
50m; End intertidal zone.

Section 2: 41m; Stream channel leaves buffer strip and enters 1982 logging unit ( continues inside unit through Section 3 and beyond).

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 76m; Tributary merges on left side. Walked from road crossing to mouth of stream along tributary. Habitat is the same as in main stem with steep gradients with cascades and .3-.9m falls over boulders/large cobble substrate. Approximately 150m from road crossing to point of merger with main stem.

Section 3: 101m; Log culvert under road crossing. End of survey.

Creek No. 4 has 2.5-3m wide intertidal channel with a cobble/sand substrate and no appreciable intertidal spawning area.

# FISH SAMPLING FORM

Stream Name Creek No. 4 ADF&G Catalog No. 106-41-26 Date 8/15/82

Identify Survey Area A Water Temp. 12.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1120	1448	2 - SS	690mm 590mm	Section 1I above intertidal zone inside buffer strip of trees.
			3 - DV	--	

This form is used to record fish caught during Level Three, Four, or Five Surveys.

LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A
2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Creek No. 3 and Red Bay #7
2. ADF&G Catalog No. 106-41-25
3. Lat. 56°16'55"
3. Long. 133°18'10"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay
9. Access 2, 4, 5
10. Camping 4
11. Present Land Use a. 1982 Logging Unit 11b. bear trails
12. Historical Land Use Old (1960's) logging in areas nearby
13. Stream Origin 3 4 5 6
14. Flow Stage 1
15. Flow estimated, 2.5 cfs  
method, width, depth, length, constant, time, grid, flow
16. Temp. Sensitivity E-W orientation, low velocity flows, shallow water depths
17. Beaver 5
18. Type aquatic Veg. 1, 4
19. Density Aquatic Veg. 3
20. Adult Salmon N
21. Intertidal a. gradient 1.5%
- b. bottom type % fines 35 %
- c. ASA 1%
- gravel small cobble 40 %
- d. schooling y
- large cobble/boulders/bedrock 25 %
- e. shellfish y
- f. Large boat anchorage along right shore of Red Bay. Skiff anchorage in areas near stream mouth.
22. Comments
  1. Large tide flat at low tide.
  2. Possible PS spawning in lower intertidal zone; poor, with moderately compact gravel.
  3. Above grass line; dense Enteromorpha sp. on rocks in channel.
  4. 21d. Schooling in Red Bay Estuary at head of Bay.
  - 21e. Dungeness crab, horse clams, cockles.
  5. Estimates in survey due to heavy debris over stream. In some areas stream hidden by debris.
23. Investigators Murph/Mickowski
24. Date 8/ 15/ 82
25. Time 1620 1800  
start end
26. Weather 3
27. Photos

R-10 2600-3a (1/81)



1982 CLEAR CUT

ROAD

106-11-025

RED BAY

-147-

106-41-25



1. Intertidal Zone Looking up Channel to Buffer Strip.



2. 0.6 Meter Clay Bank Slump Delineates the Upper Extent of the Intertidal Zone.



3. Section 1: Excellent Riffle/Pool Section. Portions of Right Bank Buffer Strip Have Blown Across Stream.



4. Section 2: The Bulk of the Right Bank Buffer Strip has Blown Across Channel.

Creek No. 3  
106-41-25

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
II	100	2	7	14					
Total				14m <sup>2</sup>					



# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Creek No. 3

ADF&G Catalog No. 106-41-25

1. Section No.	1I	2	3				
2. Compass Bearing	351	47	54				
3. Gradient	7	3-5	7-8	Estimated due to heavy debris			
4. Temperature: Air	15	15	15	and brush.			
Water	11.5	11.5	11.5				
5. Water qual: a. color	1	1	1				
b. turbidity	1	1	1				
c. pH	7.7	7.7	7.7				
6. Streambottom Substrate	1	--	5	20			
	2	5	15	25			
	3	45	50	20			
	4	25	15	15			
	5	25	15	15			
	6	--	--	--			
	7	--	--	b) 5			
7. ASA a. percent	7	--	--				
b. quality	2	--	--				
8. Water Width a. channel	2.3	5.5	3.7				
b. water	2.0	1.5	3.5				
c. floodplain	3	1	2				
9. Stream Pools a. percent	15	15	15				
b. category	SS	SF	SF				
10. Rearing Area	10	10	10				
11. Debris Loading	15	100	90				
12. Potential Barriers	N	N	N				
13. Enhancement/Rehab	N	Y	Y				
14. Streambank Veg.	5	1,3,5	1-5				
15. Upper Bank a. Left	0	10est	7				
b. Right	0	10est	4				
b. indic Left	N	N	N				
Right	N	N	N				
c. veg Left	N	N	N				
Right	N	N	N				
16. Lower Bank Left	GS	GS	U				
Right	SS	SS	GS				
17. Stab rating Left	1(2)	1(1)	1(1)				
Right	2(1)	1(1)	1(2)				
18. Stream Canopy Cover	3	2	1				
19. Fish Species	SS	--	--				
	CT	--	1	--			
	DV	--	1	--			
20. Sampling	N	N	N				

21. Comments

Fair to poor PS ASA in intertidal zone.

Section 1I: Began at grass edge along left side.

24m; .4-.6m vertical drop into 0.4m DS pool with banks (1.2m) of blue clay. Lower banks of first 24m of 1Z are 1.2m high.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 1I: 29m; Channel enters dense alder/brush. End intertidal zone.  
Braided channels converge.

69m; Seep converges with main stem via the left bank.

92m; Debris jam induced channel braiding, 40m.

Section 2/3: Data estimated due to extreme densities of blowdown, the result of an ineffective buffer strip bordering the right bank. Moderate to steep gradients, a primarily cobble/boulder substrate, and "unstable" hydraulics preclude fisheries habitation at present.

Survey terminated approximately 75m below bridge/spur road crossing due to lack of habitat and the inability of the investigators to see the channel. Above the road crossing, stream gradient increases to approximately 15% through a debris choked notch.

Rehabilitation recommendations are to remove the blowdown from the channel, however, fisheries habitat throughout the survey was isolated and sparse.

LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Creek No. 2 & Red Bay #6 3. Lat. 56°17'00"
2. ADF&G Catalog No. 106-41-24 3. Long. 133°18'15"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay 9. Access 2, 4, 5 10. Camping 4
11. Present Land Use a. Logging Unit, 1982 11b. bear trails
12. Historical Land Use Logging in areas nearby
13. Stream Origin 3 4 5 6 14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, grid, flow 1-1.5 cfs
16. Temp. Sensitivity E-W orientation; low velocity flows; shallow water depth
17. Beaver 5 18. Type aquatic Veg. 1 19. Density Aquatic Veg. 3
20. Adult Salmon N 21. Intertidal a. gradient 4.5
- b. bottom type % fines 8 % c. ASA 0
- gravel small cobble 45 % d. schooling Y
- large cobble/boulders/bedrock 47 % e. shellfish Y
- f. Large boat anchorage along right shore of Red Bay; small boat anchorage off stream mouth.
22. Comments
  1. Low tide at 0724 hours (-2.7 ft); large tide flat at low tide.
  2. 21d. head of Red Bay
  3. 21e. Dungeness crab in large amounts; cockles, horse clams.
  4. 20. Adult salmon observed jumping in area near mouth of stream.
  5. Dense Enteromorpha sp. on rocks in intertidal zone.
  6. Section 11 begins at beach grass on left bank of 2-3' deep channel.
  7. Gradients are estimated due to brush and sinuosity of stream.
  8. ASA would be increased by factor of 2 if logging activity was not occurring.
23. Investigators Murph/Mickowski
24. Date 8/17/82 25. Time 0830 0935 26. Weather 3
- start end
27. Photos

R-10 2600-3a (1/81)



1982 CLEAR CUT

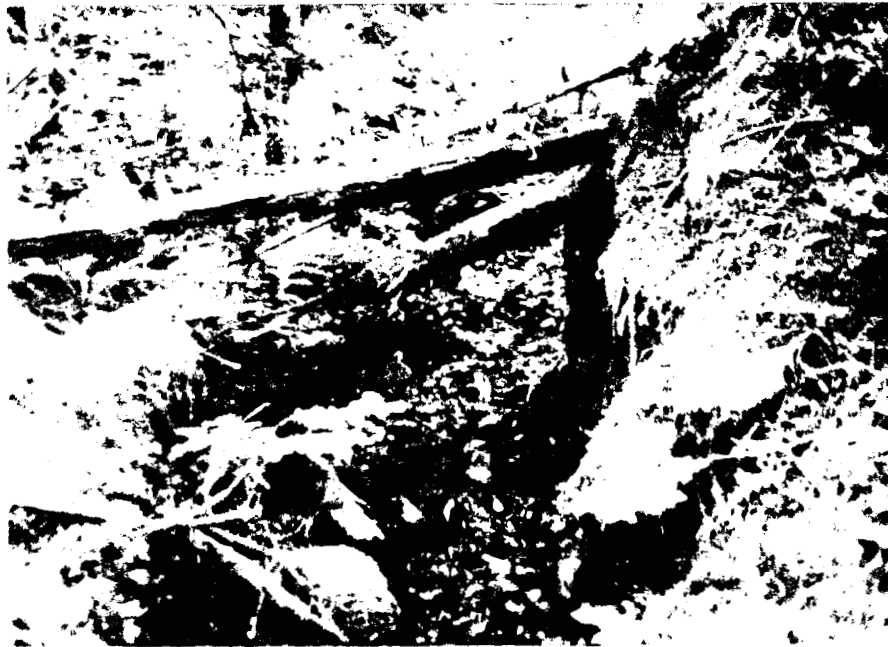
ROAD

106-02-11-901

RED BAY



1. Upchannel View From Intertidal Zone in Section 1.



2. Section 1I: Cobble Substrate and Heavy Blowdown Debris Characterize This Small Steep Channel.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Creek No. 2

ADF&G Catalog No. 106-41-24

1. Section No.	1I	2						
2. Compass Bearing	349	338						
3. Gradient	8-9est	10-13est	Estimated due to heavy debris					
4. Temperature: Air	12	13	and brush.					
	Water	11	10					
5. Water qual:	a. color	1	1					
	b. turbidity	1	1					
	c. pH	--	8					
6. Streambottom Substrate	1	7	12					
	2	40	40					
	3	35	30					
	4	10	10					
	5	3	3					
	6	--	--					
	7	b) 2c) 3	b) 2c) 3					
7. ASA	a. percent	0	--					
	b. quality	0	--					
8. Water Width	a. channel	1.75	1.25					
	b. water	1.75	1.0					
	c. floodplain	3	2					
9. Stream Pools	a. percent	15	15					
	b. category	SS	SS					
10. Rearing Area		15	10					
11. Debris Loading		20	35					
12. Potential Barriers		N	N					
13. Enhancement/Rehab		N	N					
14. Streambank Veg.		5	1,3,4					
15. Upper Bank	a. Left	0	7					
	b. Right	0	33					
	b. indic							
	Left	N	N					
	Right	N	N					
	c. veg							
	Left	N	N					
	Right	N	N					
16. Lower Bank	Left	SS	U					
	Right	U	SS					
17. Stab rating	Left	1(1)	1(1)					
	Right	1(1)	1(1)					
18. Stream Canopy Cover		3	1					
19. Fish Species								
	No Fish Observed.							
20. Sampling		Y	N					

21. Comments

Section 1I: 43m; Stream enters tree line; end of intertidal zone, which is very sinuous.  
Substrate is large cobble/small cobble (gravel). Banks are typically undercut and gradients are on the order of 10%.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: Has steepening gradients, copious debris, large cobble/small cobble substrate with many riffles due to gradient. Most pools debris induced.

Reconnaissance 100m above end of survey revealed the stream cascades with +15% gradients and 1.0m falls over debris dams with SF pools between heavy debris (logs) loading (40%) and dense brush/devil's club. Channel is in a ravine with 25-45% side slopes. Substrate is 70% sand/silt and 30% large/small cobble.

## FISH SAMPLING FORM

Stream Name Creek No. 2 ADF&G Catalog No. 106-41-24 Date 8/17/82

Identify Survey Area A Water Temp. 11.0°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0855	0935	0	--	Section 1; 56m pool on right side under undercut bank.
2	0900	0935	0	--	Section 1; 71m.

This form is used to record fish caught during Level Three, Four, or Five Surveys.



LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay #5 3. Lat. 56°17'05"
2. ADF&G Catalog No. -- 3. Long. 133°18'20"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay 9. Access 4, 5, 6 10. Camping 4
11. Present Land Use a. Logging Unit (1982) 11b. bear sign and trail
12. Historical Land Use 1960's logging in nearby areas
13. Stream Origin 3 5 6 14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, Estimated, <1 cfs  
grid flow
16. Temp. Sensitivity Low velocity flow; shallow water depths.
17. Beaver 5 18. Type aquatic Veg. 1, 4 19. Density Aquatic Veg. 3
20. Adult Salmon N 21. Intertidal a. gradient 6%
- b. bottom type % fines 80 % c. ASA 1%
- gravel small cobble 15 % d. schooling y
- large cobble/boulders/bedrock 5% e. shellfish y
- f. Large boat anchorage along right shore of Red Bay. Skiff anchorage off stream mouth.
22. Comments
  1. High tide at 1332 hours. Large mud flats in intertidal zone. Canada geese observed on flats.
  2. 21d. Schooling areas in Red Bay; adult salmon observed jumping in Bay. 21e. Dungeness crab in Red Bay; horse clams and cockle shells observed.
  3. Beach grasses growing in stream channel in intertidal zone. Channel is very sinuous with 12-18" high lower banks. No Enteromorpha sp. observed in intertidal zone.
  4. 21c. 1% fair PS ASA. This is a small system whose lower end has minimal ASA and heavy debris inside tree line. Little flow <1.0 cfs.
23. Investigators Murph/Mickowski
24. Date 8 /17 / 82 25. Time 1240 1255 26. Weather 6  
start end
27. Photos

R-10 2600-3a (1/81)



1982 CLEAR CUT

ROAD

RD #5

RED BAY

# Red Bay #5

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
II	100	1.5	2	<u>3m<sup>2</sup></u>					
Total				3m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay #5 ADF&G Catalog No. --

1. Section No.	11	2					
2. Compass Bearing	337	8					
3. Gradient	8	+10%	- Estimated due to stream sinuosity,				
4. Temperature: Air	13.5	13.5	heavy brush and debris.				
Water	11.5	11.5					
5. Water qual: a. color	1	1					
b. turbidity	1	1					
c. pH	7.5	7.5					
6. Streambottom Substrate	1	--					
	2	15					
	3	25					
	4	20					
	5	20					
	6	10					
	7	30					
7. ASA a. percent	2	--					
b. quality	1						
8. Water Width a. channel	1.5	1.25					
b. water	1.5	1.0					
c. floodplain	3	1					
9. Stream Pools a. percent	45	--					
b. category	SS	--					
10. Rearing Area	25	--					
11. Debris Loading	20	--					
12. Potential Barriers	N	N					
13. Enhancement/Rehab	N	N					
14. Streambank Veg.	5	1-5					
15. Upper Bank a. Left	0	8					
b. Right	0	9					
b. indic Left	N	N					
Right	N	N					
c. veg Left	N	N					
Right	N	N					
16. Lower Bank Left	U	U					
Right	GS	U					
17. Stab rating Left	1(1)	1(1)					
Right	1(2)	1(1)					
18. Stream Canopy Cover	3	2					
19. Fish Species							
No Fish Observed							
20. Sampling	Y	N					

## 21. Comments

Section 11: 0.0m; Survey begun at edge of beach grass.  
45m; Enter treeline end intertidal zone.

Section 2: 84m-89m; Stream lost under debris. Very dense brush and  
blowdown over stream. End survey.

## FISH SAMPLING FORM

Stream Name Red Bay #5 ADF&G Catalog No. -- Date 8/17/82

Identify Survey Area A Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0940	1220	0	--	Section 1; 58m above intertidal zone.
2	0945	1235	0	--	Section 1; 79m above intertidal zone.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Creek No. 1 and Red Bay #4 3. Lat. 56°17'10"
2. ADF&G Catalog No. 106-41-23 3. Long. 133°18'25"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay 9. Access 2, 4, 5, 6 10. Camping 4
11. Present Land Use a. 1982 logging unit 11b. bear trails
12. Historical Land Use 1960's logging units in area
13. Stream Origin 3 5 6 14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, <2 cfs  
grid flow
16. Temp. Sensitivity Low velocity flow; shallow water depths
17. Beaver 5 18. Type aquatic Veg. 1, 4 19. Density Aquatic Veg. 3
20. Adult Salmon N 21. Intertidal a. gradient 3.5%  
b. bottom type % fines 35% c. ASA 1%  
gravel small cobble 60% d. schooling Y  
large cobble/boulders/bedrock 5% e. shellfish Y  
Large boat anchorages along right shore of Red Bay. Skiff anchorage off  
f. stream mouth.
22. Comments  
1. High tide at 1332 hours. Large mud tide flats in intertidal zone.  
2. 21d. Schooling areas in Red Bay; adult salmon observed jumping in bay.  
21e. Dungeness crab in Bay, horse clams and cockles.  
3. Dense Enteromorpha sp. in lower 1/2 of Section 11.  
4. U.S. Forest Service metal tag named this: "Stream #6, ADF&G #1"  
Flagged b/w
23. Investigators Murph/Mickowski
24. Date 8 / 17 / 82 25. Time 1255 1445 26. Weather 6  
start end
27. Photos

R-10 2600-3a (1/81)



1982 CLEAR CUT

ROAD

10/6-11-02-3

RED BAY

Creek #1  
106-41-23



1. The ITZ Looking West Over Red Bay.



2. The ITZ Looking Toward the Creek Mouth.  
Intertidal ASA is Poor Due to a Large  
Percentage of Fine Substrate.



Creek #1  
106-41-23



3. Fifty Meters up From the ITZ. Dense Streambank Vegetation and Undercut Banks Provide Good Cover.



4. Debris Loading is Reduced in Section 4. ASA is Limited Due to Low Flow.

Creek No. 1  
106-41-23

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
2	100	1.5	2	3					
Total				3m <sup>2</sup>					

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Creek No. 1

ADF&G Catalog No. 106-41-23

1. Section No.	11	2	3	4	5			
2. Compass Bearing	6	5	26	16	2			
3. Gradient	5	5	7	7	12	Estimated due to heavy		
4. Temperature: Air	15	15	14.5	14.5	14.5	debris and brush.		
Water	11.5	11.5	11.5	11.5	11.5			
5. Water qual: a. color	1	1	1	1	1			
b. turbidity	1	1	1	1	1			
c. pH	--	7.8	7.8	7.8	7.8			
6. Streambottom Substrate	1	10	15	20	20	25		
	2	20	30	35	35	40		
	3	35	30	20	23	20		
	4	20	15	12	12	10		
	5	10	5	10	10	5		
	6	--	--	--	--	--		
	7	b) 3 c) 2	b) 3 c) 2	b) 1 c) 2	--	--		
7. ASA a. percent	--	2	--	--	--			
b. quality	--	2	--	--	--			
8. Water Width a. channel	2.6	4.2	2.05	2.6	2.0			
b. water	2.6	1.5	2.5'	1.75	1.75			
c. floodplain	3	3	2	3	2			
9. Stream Pools a. percent	40	30	25	20	15			
b. category	SS	SS	SS	SS	SS			
10. Rearing Area	20	15	10	15	5			
11. Debris Loading	20	35	60	15	30			
12. Potential Barriers	N	N	N	N	N			
13. Enhancement/Rehab	N	N	N	N	N			
14. Streambank Veg.	5	1-5	1-5	1-5	1-5			
15. Upper Bank a. Left	0	16	9	29	16			
b. Right	0	9	45	14	6			
b. indic Left	N	N	N	*	N			
Right	N	N	*	N	N			
c. veg Left	N	N	N	N	N			
Right	N	N	N	N	N			
16. Lower Bank Left	U	U	GS	SS	SS			
Right	SS	GS	U	U	SS			
17. Stab rating Left	1(1)	2(2)	1(2)	1(2)	1(2)			
Right	1(1)	2(1)	1(2)	1(2)	1(2)			
18. Stream Canopy Cover	3	1	2	1	1			
19. Fish Species	SS	--	--	--	--			
	CT	--	--	--	--			
	DV	--	--	<6	>6	3		
20. Sampling	Y	N	N	N	N			

21. Comments

Section 1: 0.0m; Survey begun 13.5m above edge of beach grasses due to high tide.  
 19.0m; Edge of treeline; end of intertidal zone.  
 Section 2 and 3: Dense devil's club along both banks with alder and salmonberry intermixed.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 3: Blowdown/debris from steep upper bank edge is falling into channel.  
7.5m; Right bank failure, 2.5mx4m.

Section 4: Debris loading reduced.  
100m; Seep enters main stem via the right bank.

Section 5: 29m; Stream forks creating two channels of nearly identical flow (i.e., less than 1 cfs). 6.5m up right fork, a 1.0 vertical meter fall flows over a debris dam creating a potential low flow barrier. No fish were observed.

The left fork/"mainstem" continues to rapidly climb (i.e., 10-12%) through a debris choked ravine via cobble/boulder cascades and SF pools.

Survey was terminated with Section 5, due to low flows and lack of habitat/fish sightings.

# FISH SAMPLING FORM

Stream Name Creek No. 1 ADF&G Catalog No. 106-41-23 Date 8/17/82  
Identify Survey Area A Water Temp. 11.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1255	1441	0	--	Section 1: 38m; in pool below one foot fall over debris.
2	1305	1440	1-DV	--	Section 1: 55m; under root in pool below 6 inch fall over roots.
3	1308	1445	1-SS	480mm	Section 1: 15m; top of intertidal zone in deep pool.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A 2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay #3 3. Lat. 56°17'10"
2. ADF&G Catalog No. -- 3. Long. 133°18'30"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay 9. Access 2, 4, 5 10. Camping 4
11. Present Land Use a. 1982 Logging Unit 11b. Bear/deer trails
12. Historical Land Use 1960's logging in nearby area.
13. Stream Origin 3 4 5 6 14. Flow Stage 1
15. Flow estimated, <0.5 cfs  
method, width, depth, length, constant, time, grid, flow
16. Temp. Sensitivity Low velocity flows, shallow water depths.
17. Beaver 5 18. Type aquatic Veg. 1, 3, 4 19. Density Aquatic Veg. 1
20. Adult Salmon N 21. Intertidal a. gradient 3.5%  
b. bottom type % fines 40% c. ASA 1%  
gravel small cobble 50% d. schooling y  
large cobble/boulders/bedrock 10% e. shellfish y  
f. Large boat anchorage along right shore of Red Bay. Skiff anchorage of point N. of stream approximately 250m.
22. Comments  
1. Large mud tide flats. Canada geese (10-15) observed on flats.  
2. 21d. Schooling area in Red Bay. Adult salmon observed jumping in Bay.  
21e. Dungeness crab  
3. No Enteromorpha sp. in intertidal zone, but a stringy green matted algae was present.
23. Investigators Murph/Mickowski
24. Date 8 / 17 / 82 25. Time 1140 1210 26. Weather 6  
start end
27. Photos \_\_\_\_\_

R-10 2600-3a (1/81)

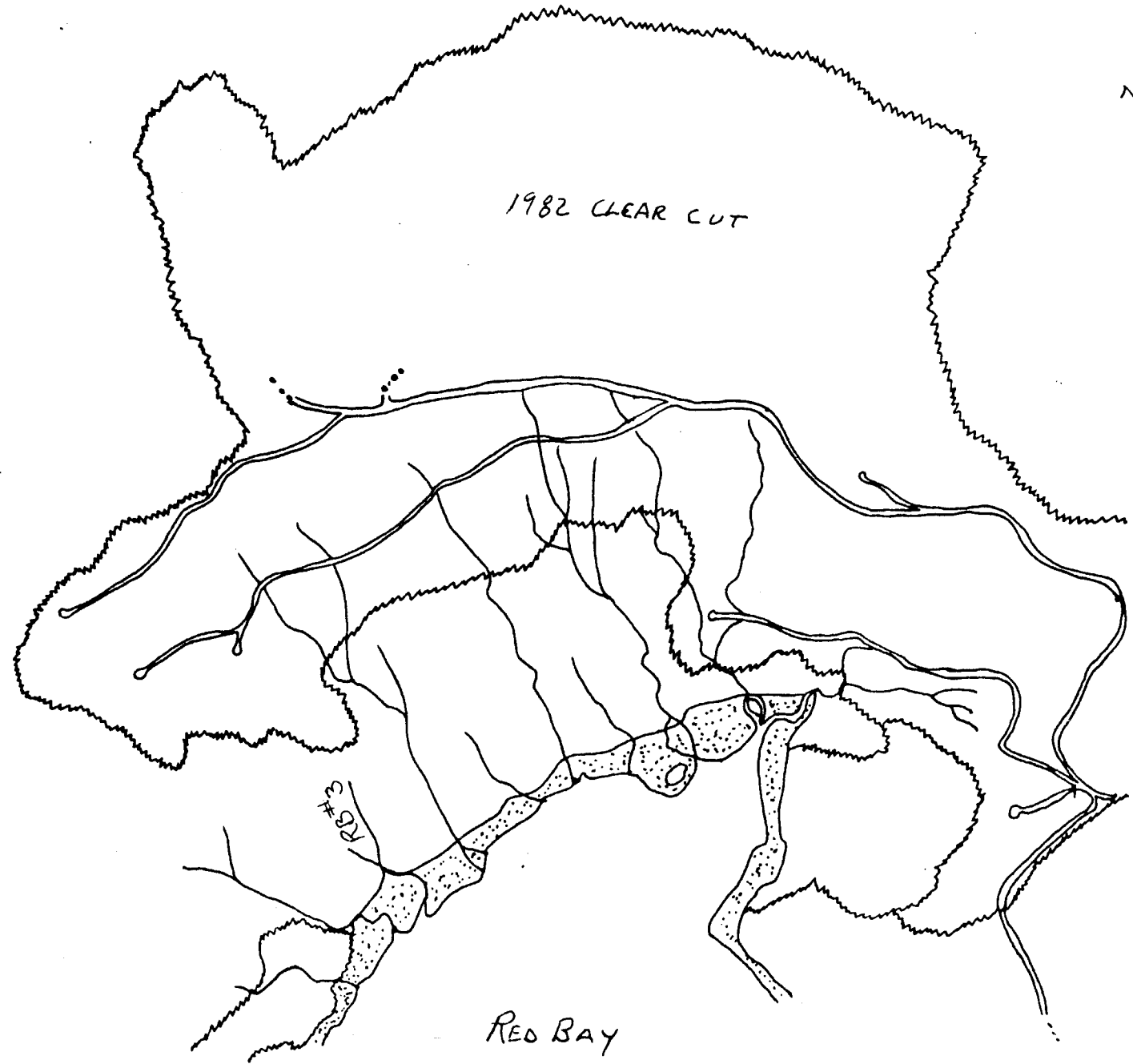


1982 CLEAR CUT

ROAD

RG#3

RED BAY



Red Bay #3

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
11	100	0.5	7	<u>3.5</u>					
Total				3.5m <sup>2</sup>					



# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay #3

ADF&G Catalog No. ---

1. Section No.	11	2						
2. Compass Bearing	333	347						
3. Gradient	4							
4. Temperature: Air	14	14						
Water	11.5	11.5						
5. Water qual: a. color	1	1						
b. turbidity	1	1						
c. pH	6.5	6.5						
6. Streambottom Substrate	1	5	--					
	2	20	--					
	3	15	--					
	4	25	--					
	5	20	--					
	6	12	---					
	7	b) 10/2	--					
7. ASA a. percent	7	--						
b. quality	1	--						
8. Water Width a. channel	2.7	1.75						
b. water	0.5	.35						
c. floodplain	3	2						
9. Stream Pools a. percent	70	--						
b. category	SS	--						
10. Rearing Area	25	--						
11. Debris Loading	15	--						
12. Potential Barriers	N	N						
13. Enhancement/Rehab	N	N						
14. Streambank Veg.	5	1,3,5						
15. Upper Bank a. Left	0	12						
b. Right	0	3						
b. indic Left	N	N						
Right	N	N						
c. veg Left	N	N						
Right	N	N						
16. Lower Bank Left	GS	GS						
Right	GS	GS						
17. Stab rating Left	1(1)	1(1)						
Right	1(1)	1(1)						
18. Stream Canopy Cover	3	1						
19. Fish Species DV	2	--						
20. Sampling	N	N						
21. Comments								

Section 11: 0m; Begun at edge of beach grass on left side. Very sinuous in ITZ. 73m; Treeline; end intertidal zone.

Section 2: 5.5m; Cobble flood channel along left bank. Dry at this time.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

105.5m from beginning of survey stream divides into several seeps with main flow along right bank. Substrate is muck/debris for majority of survey. Dense rust bacteria in 70% of pools and riparian vegetation in flow channel. Few fish observed. Potential PS/SS ASA of poor quality for first 40m above intertidal zone; nice, small cobble/gravel substrate at higher flows for approximately 15m.

## LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 230.41.

1. Survey Areas A 2. Equipment \_\_\_\_\_  
3. Historical Fish Species No Escapement Data Available.  
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay #2 3. Lat. 56°17'10"  
2. ADF&G Catalog No. -- 3. Long. 133°18'30"  
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4  
7. Aerial Photo No. 71-18-104 71-18-103  
8. Bay/Drainage Red Bay 9. Access 4 5 10. Camping 4  
11. Present Land Use a. 1982 logging unit 11b. bear/deer trails  
12. Historical Land Use borders 1960's logging unit on left side of stream  
13. Stream Origin 3 4 5 6 14. Flow Stage 1  
15. Flow method, width, depth, length, constant, time estimated, <1 cfs  
grid flow  
16. Temp. Sensitivity N-S orientation, low velocity flow, shallow water depths  
17. Beaver 5 18. Type aquatic Veg. 1, 4 19. Density Aquatic Veg. 3  
20. Adult Salmon y 21. Intertidal a. gradient 4.0  
b. bottom type % fines 30 % c. ASA 1%  
gravel small cobble 50 % d. schooling y  
large cobble/boulders/bedrock 20 % e. shellfish y  
f. Large boat anchorage along right shore of Red Bay. Skiff anchorage off point N. of stream approximately 150m.  
22. Comments  
1. Large mud tide flat. 10-15 Canadian geese observed on flats.  
2. 21d. Schooling in Red Bay; adult salmon observed jumping in bay.  
21e. Dungeness crab and horse clams.  
3. No Enteromorpha sp. in intertidal zone. Fucus sp. present below beach grasses.  
Evaluation: A small, silty stream with a sand/gravel substrate; first 50m above intertidal zone is fair PS/SS ASA (<1% grad.) at higher waterflows. Gradients are moderate and increasing above end of survey. Stream flows just outside an old (1960's) clearcut by ~30m on left bank. Heavy debris in Sections 2 & 3 with large trees over stream & heavy devils club & brush on banks. One coho fry observed in intertidal zone.  
23. Investigators Murph/Mickowski  
24. Date 8/17/82 25. Time 1035 1120 26. Weather 6  
start end  
27. Photos

R-10 2600-3a (1/81)

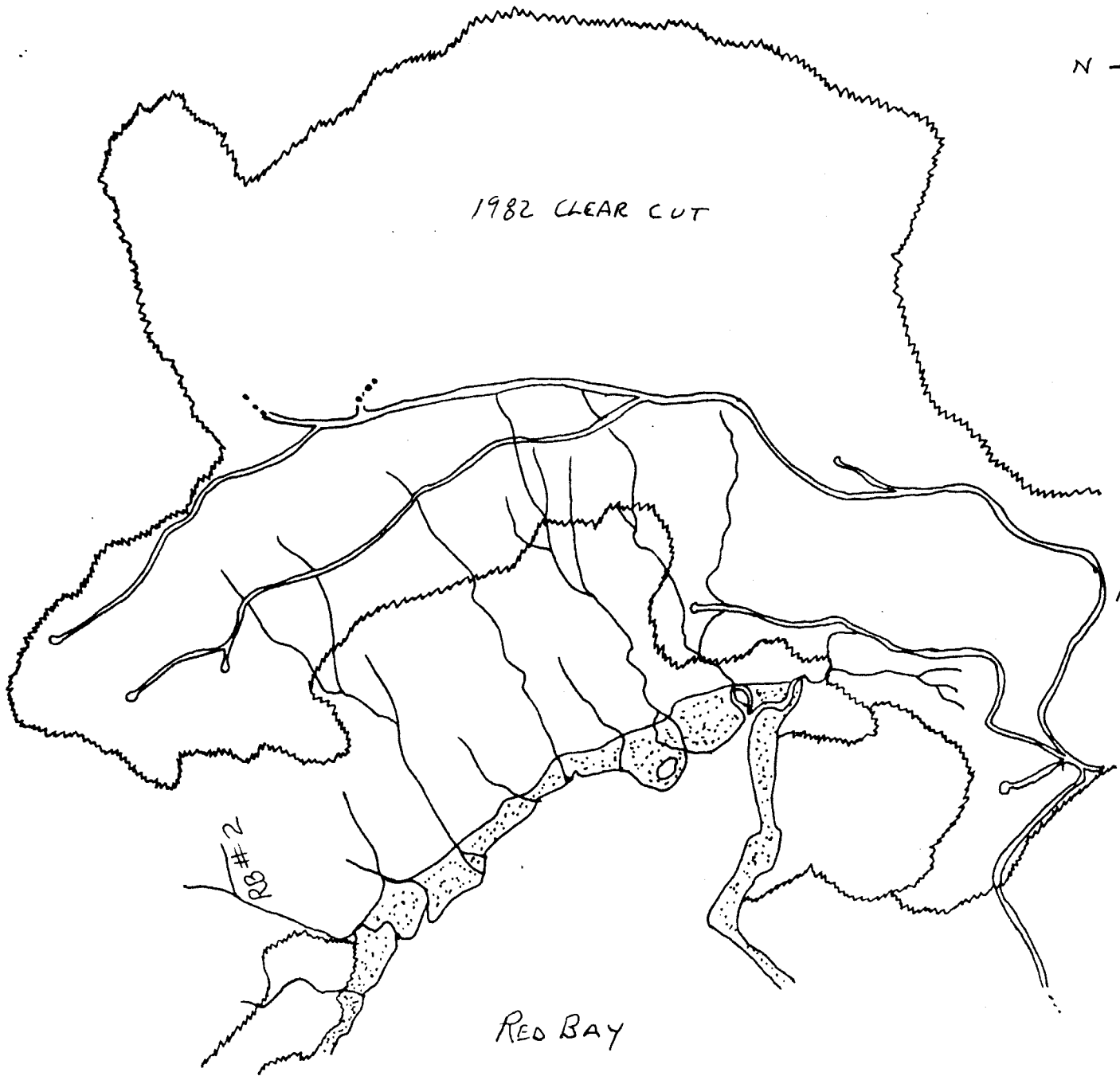


1982 CLEAR CUT

ROAD

2  
#  
R81

RED BAY



Red Bay #2

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	100	1.5	10	15					
2	100	1.0	3	3					
Total				18m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay #2

ADF&G Catalog No. --

1. Section No.		11	2	3				
2. Compass Bearing		328	322	316				
3. Gradient		4	6	5 -	Estimated due to heavy debris			
4. Temperature: Air		13	13.5	13.5	and brush.			
	Water	12.5	11.5	11.5				
5. Water qual:	a. color	1	1	1				
	b. turbidity	1	1	1				
	c. pH	--	7.0	7.0				
6. Streambottom	Substrate	1	5	10	10			
		2	15	25	30			
		3	25	35	35			
		4	30	15	10			
		5	15	10	10			
		6	8	--	--			
		7	c) 2	b) 2 c) 3	b) 2 c) 3			
7. ASA	a. percent	10	3	--				
	b. quality	1	1	--				
8. Water Width	a. channel	1.5	1.75	3.1				
	b. water	1.5	1.0	<1				
	c. floodplain	3	3	1				
9. Stream Pools	a. percent	80	80	35				
	b. category	SS	SS	SS				
10. Rearing Area		30	60	25				
11. Debris Loading		15	35	80				
12. Potential Barriers		N	N	N				
13. Enhancement/Rehab		N	N	N				
14. Streambank Veg.		5	1,3,5	1,3-5				
15. Upper Bank	a. Left	0	10	19				
	b. Right	0	5	27				
	b. indic							
	Left	N	N	N				
	Right	N	N	N				
	c. veg							
	Left	N	N	N				
	Right	N	N	N				
16. Lower Bank	Left	SS	GS	U				
	Right	SS	U	U				
17. Stab rating	Left	1(1)	1(2)	1(1)				
	Right	1(1)	1(1)	1(1)				
18. Stream Canopy Cover		3	1	2				
19. Fish Species	SS	1	--	--				
(uncertain ID)	DV/CT	--	--	2				
20. Sampling		N	N	N				

21. Comments

1. Section 11: 0m; Begins on grass edge on left bank.  
59m; Enters treeline; end intertidal zone at 283° compass bearing.
2. Survey terminated with Section 3 due to lack of ASA, climbing gradients, and heavy blowdown. Two fish seen but ID uncertain (CT or DV)?

LEVEL THREE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A
2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay #1
2. ADF&G Catalog No. --
3. Lat. 56°17'10"
3. Long. 133°18'35"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-103 71-18-104
8. Bay/Drainage Red Bay
9. Access 4 5
10. Camping 4
11. Present Land Use a. None Observed
- 11b. bear sign
12. Historical Land Use flows out of old (1960's) logging unit
13. Stream Origin 3 4 5 6
14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, grid, flow, <0.5 cfs
16. Temp. Sensitivity E-W orientation; low velocity flow, shallow water depths
17. Beaver 5
18. Type aquatic Veg. 1, 4
19. Density Aquatic Veg. 1
20. Adult Salmon N
21. Intertidal a. gradient 3.0%
- b. bottom type % fines 10 %
- c. ASA 1%
- gravel small cobble 75 %
- d. schooling y
- large cobble/boulders/bedrock 15 %
- e. shellfish y
- f. Large boat anchorage along right shore of Red Bay. Skiff anchorage in areas near stream mouth and off point N. of stream.
22. Comments
  1. Large tide flat with rocky areas.
  2. 21d. Schooling in Red Bay. Adult salmon jumping in bay.
  - 21e. Dungeness crab.
  3. This stream appears to be ephemeral with heavy riparian growth inside treeline (above intertidal zone) in stream channel. The substrate is muck/silt/gravel over a 1% gradient, 0 ASA above intertidal zone, and heavy logging debris. 1% ASA of fair quality for PS in intertidal zone. NO survey sections done.
23. Investigators Murph/Mickowski
24. Date 8/17/82
25. Time 1020 1030
- start end
26. Weather 3
27. Photos

R-10 2600-3a (1/81)



1982 CLEAR CUT

ROAD

1#31

RED BAY



# LEVEL 100E - HABITAT SURVEY FORM (Part's 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A
2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 70m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay - East #1
2. ADP&G Catalog No. N/A
3. Lat. 56°18'20"
3. Long. 133°19'10"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. \_\_\_\_\_
8. Bay/Drainage Red Bay
9. Access 4
6. 6
10. Camping 4
11. Present Land Use a. None
- 11b. Game trails
12. Historical Land Use Clearcut logging
13. Stream Origin 3 5 6
14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, grid, flow ~1.5 cfs
16. Temp. Sensitivity Beaver impoundment.
17. Beaver 3
18. Type aquatic Veg. 1
19. Density Aquatic Veg. 3
20. Adult Salmon No
21. Intertidal a. gradient N/A
- b. bottom type % fines N/A %
- c. ASA N/A
- gravel small cobble N/A %
- d. schooling N/A
- large cobble/boulders/bedrock N/A %
- e. shellfish N/A
- f. Anchorage in Red Bay. Extensive intertidal zone at mouth.
22. Comments  
Intertidal parameters unavailable due to high tide. A small, steep, extremely disturbed stream, draining into the southern portion of 106-41-22's intertidal zone. No spawning or rearing habitat observed. No fish sighted.

23. Investigators Mickowski/Merrigan
24. Date 9 /20 /82
25. Time 1500 1530
- start end
26. Weather 2
27. Photos \_\_\_\_\_

R-10 2600-3a (1/

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - East #1

ADF&G Catalog No. N/A

1. Section No.	11							
2. Compass Bearing	131							
3. Gradient	~9							
4. Temperature: Air	13							
	Water	11						
5. Water qual:	a. color	3						
	b. turbidity	1						
	c. pH	5.6						
6. Streambottom Substrate	1	15						
	2	20						
	3	25						
	4	15						
	5	15						
	6	--						
	7 a)	10						
7. ASA	a. percent	--						
	b. quality	--						
8. Water Width	a. channel	~1.2						
	b. water	~.6						
	c. floodplain	1						
9. Stream Pools	a. percent	10						
	b. category	SF						
10. Rearing Area		--						
11. Debris Loading		35						
12. Potential Barriers		Y						
13. Enhancement/Rehab		N						
14. Streambank Veg.		1-3,5						
15. Upper Bank	a. Left	26						
	b. Right	10						
	b. indic							
	Left	N						
	Right	N						
	c. veg							
	Left	N						
	Right	N						
16. Lower Bank	Left	SS						
	Right	GS						
17. Stab rating	Left	1(2)						
	Right	1(2)						
18. Stream Canopy Cover		1						
19. Fish Species								
20. Sampling		N						
21. Comments								

Small steep stream with copious debris "barriers" and dark brown water. Survey terminates at the base of an inactive beaver dam set at the head of a steep cut. No spawning or rearing habitat observed. No fish sighted. Substrate values were estimated due to the heavy concentration of instream debris and dense overhanging vegetation.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 11: 0m; Channel enters coniferous regeneration; old logging unit extends to both banks.  
21m; Intertidal zone ends.  
31m; Gradient increasing.  
70m; Base of an inactive beaver dam in poor repair, 1.8m high by 12m across. End of survey.

# LEVEL FORM - FISH HABITAT SURVEY FORM (Parts 1 and 2)

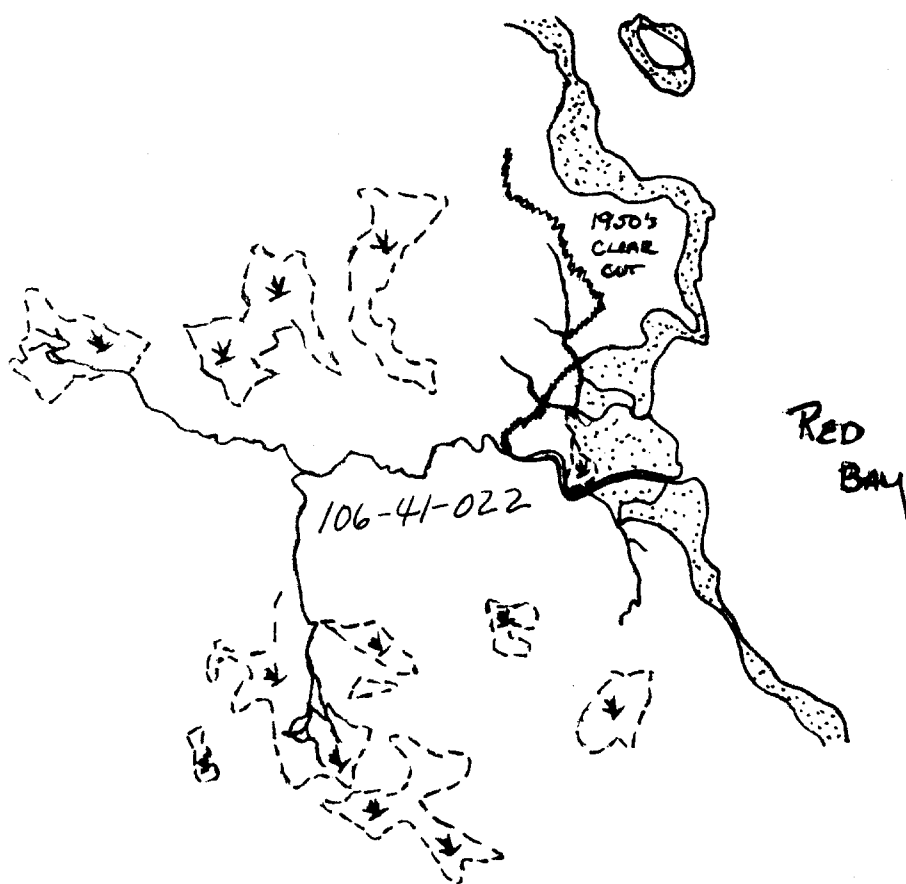
Part 1 - Instructions for completing this part are found in FSH 2009.23 R 10 Section 390.41.

1. Survey Areas A, B 2. Equipment --
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2009.23 R 10 Section 390.42.

1. Stream Name Red Bay - East #2 3. Lat. 56°18'20"
2. AD&G Catalog No. 106-41-22 3. Long. 133°18'55"
4. Agency Unit 05 5. Mgmt Area 532 K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-101 through 71-18-103
8. Bay/Drainage Red Bay 9. Access 4 6 10 10. Camping 4
11. Present Land Use a. None 11b. Game trails
12. Historical Land Use Beach accessed logging.
13. Stream Origin 3 4 5 6 14. Flow Stage estimated, 3.5 cfs
15. Flow method, width, depth, length, constant, time, grid, flow
16. Temp. Sensitivity Beaver impounded headwaters.
17. Beaver 2 18. Type aquatic Veg. 1, 2 19. Density Aquatic Veg. 2
20. Adult Salmon No 21. Intertidal a. gradient 2
- b. bottom type % fines 30% c. ASA Poor/Heavily Compacted
- gravel small cobble 60% d. schooling High Tide Only/
- large cobble/boulders/bedrock 10% e. shellfish Clams Red Bay
- f. Anchorage off point, south of mouth in Red Bay
22. Comments  
Moderate densities of clams observed spouting throughout intertidal zone. Channel drains an old beach accessed logging unit for the first five sections and bears scars of skidding activities. Numerous bedrock and blue-clay outcrops occur throughout Sections 3-9. Old growth forest is traversed in Sections 6-9, while a highly sinuous and generally undercut channel drains muskegs and a headwater beaver impoundment in Sections 10-13. No SS were observed above the dam. Overall, limited ASA and excellent rearing habitat observed. Fish observations were hampered throughout survey by extremely dark conditions and water color.
23. Investigators Mickowski/Merrigan
24. Date 9/20/82 25. Time 0845 1500 26. Weather 3
- start end
27. Photos

R-10 2600-3a (1/81)



Red Bay: East #2  
106-41-22



1. Downstream View of Lower ITZ, Looking West  
Toward Red Bay.



2. Upper ITZ and Mouth With Unit on Both Banks.

Red Bay: East #2  
106-41-22



3. Section 1: Complete Alder Canopy Over  
Boulder/Cobble Substrate.



4. Mouth of Tributary "B" Entering Main Stem,  
Section 9: 92 m Left Side.

Red Bay: East #2  
106-41-22



5. Meandering, Sinuous Habitat, Approximately  
Section 13.



6. Beaver Dam and Pond/Marsh. End of Survey,  
Section 13: 46 m.



Red Bay - East #2  
106-41-22

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Area A					Area B				
2I	100	9.2	5	46	2	100	1.3	7	9.1
7	100	3.2	3	9.6	3	100	1.0	1	1
9	100	2.6	5	13	4	100	1.0	1	1
10	100	2.2	8	<u>17.6</u>	7	100	1.0	1	<u>1</u>
Total				86.2m <sup>2</sup>	Total				12.1m <sup>2</sup>

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - East #2: Area A ADF&G Catalog No. 106-41-22

1. Section No.		11	21	3	4	5	6	7	8
2. Compass Bearing		177	89	122	91	98	92	136	22
3. Gradient		2	2.5	3	3	4	~6	~5	~4
4. Temperature: Air		11	11	11	11	10	10	10	10
	Water	10	10	10	10	10	10	10	10
5. Water qual:	a. color	3	3	3	3	3	3	3	3
	b. turbidity	1	1	1	1	1	1	1	1
	c. pH	--	--	6.8	6.8	6.8	6.8	6.8	6.8
6. Streambottom	Substrate	5	20	25	20	30	20	15	18
		5	20	30	25	25	20	20	30
		45	30	20	30	25	30	35	25
		30	20	12	15	13	20	20	15
		15	10	10	9	5	7	7	9
		--	--	a <sup>-</sup>	b <sup>-</sup>	b <sup>-</sup>	b <sup>-</sup>	b <sup>-</sup>	a <sup>-</sup> b <sup>-</sup>
		--	--	3	1	2	3	3	2b <sup>-</sup> 1
7. ASA	a. percent	--	5	--	--	--	--	3	--
	b. quality	--	1	--	--	--	--	1	--
8. Water Width	a. channel	16.3	13.5	5.2	3.3	5.3	6.5	6	3.3
	b. water	2.7	*	4.5	3	2.6	2.9	3.2	3.3
	c. floodplain	1	1	1	1	2	1	1	1
9. Stream Pools	a. percent	30	45	35	20	15	40	40	40
	b. category	SS	SS	SS	SS	SS	SS/DS	SS/DS	SS/DS
10. Rearing Area		15	30	30	20	10	40	40	35
11. Debris Loading		4	1	4	4	6	8	12	9
12. Potential Barriers		N	N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N	N
14. Streambank Veg.		1-3,5	1-3,5	1-3,5	1-3,5	1-3,5	1-3,5	1-3,5	1-3,5
15. Upper Bank	a. Left	19	31	29	34	14	37	22	11
	b. Right	6	22	19	24	45	9	15	64
	b. indic								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
	c. veg								
	Left	N	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N	N
16. Lower Bank	Left	U	U	SS	U	SS	U	GS	GS
	Right	U	U	U	SS	U	GS	U	U
17. Stab rating	Left	1(2)	1(2)	1(2)	1(2)	1(1)	1(2)	1(2)	1(3)
	Right	1(2)	1(2)	1(2)	1(1)	2(1)	1(1)	1(2)	1(2)
18. Stream Canopy Cover		1	1	3	3	3	2	3	2
19. Fish Species	SS	N	N	N	N	N	N	1	N
	CT	N	N	N	N	N	N	3	1
	Juv. DV	N	N	N	N	N	N	2	N
	Adult DV	N	N	N	N	N	N	N	N
	CO	1	1	N	N	N	N	1	N
20. Sampling		N	N	Y	N	N	N	Y	N

21. Comments \*1.0/1.2/7.0

Section 11: Survey began at point where channel changes orientation from 60° to 177°. Tide flats are marred by skidding scars. Channel is extensively braided, riffle areas are heavily compacted. Aquatic algae is abundant throughout. Conifer reproduction along both banks is dense.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

- Section 1I: 50m; Timber begins right bank.  
78m; Skid path from channel to tide flats.  
88m; Unit boundary to right stream bank.  
95m; Unit boundary to left stream bank.
- Section 2I: ASA was extrapolated by 3% due to low flow, heavy compaction and instream algae throughout.  
48m; End intertidal zone; wide gravel bars with braided channels.  
68m; Complete alder coverage begins; stream becomes channelized.
- Section 3: 9m; Increasing gradient; dense instream moss and algae throughout.  
63m; Bedrock outcrop, 9 meters, right bank.
- Section 4: Dense algae coverage throughout.  
96m; Instream blue clay deposit, 2m by 8m, right bank.
- Section 5: Dense algae coverage throughout.  
65m; Instream blue clay deposit; 10 meters; right bank.  
94m; Instream blue clay deposit; 1m by 1m; left bank.
- Section 6: Heavy algae and moderate moss throughout.  
20m; Old growth begins, both banks.  
54m; Passable debris jam.
- Section 7: Moderate moss coverage throughout.  
92m; Instream blue clay deposit; 4 meters; right bank.
- Section 8: 0m; Bedrock outcrop, 10 meters, left bank.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - East #2 Area A ADF&G Catalog No. 106-41-22

1. Section No.		9	10	11	12	13			
2. Compass Bearing		41	151	91	131	128			
3. Gradient		~4	2	1.5	2.5	1.5			
4. Temperature: Air		10	10	11	11	11			
Water		10	11.5	11.5	11.5	11.5			
5. Water qual: a. color		3	3	3	3	3			
b. turbidity		1	1	1	1	1			
c. pH		6.8	6.8	6.8	6.8	6.8			
6. Streambottom Substrate	1	15	--	5	15	5			
	2	15	4	20	20	10			
	3	20	35	22	20	20			
	4	20	40	15	20	42			
	5	14	20	23	20	20			
	6	--	--	--	--	--			
	7	a) 15 b) 1	a) 10 b) 5	a) 2 c) 3	d) 3				
7. ASA a. percent		5	8	--	--	--			
b. quality		1	1	--	--	--			
8. Water Width a. channel		3.6	2.4	2	1	2.8			
b. water		2.6	2.2	~1.4	~1	2.7			
c. floodplain		1	2	1	1	1			
9. Stream Pools a. percent		55	60	50	40	90			
b. category		SS/DS	SS	SS	SS	DS/SS			
10. Rearing Area		45	60	50	40	90			
11. Debris Loading		12	10	20	12	3			
12. Potential Barriers		N	N	N	N				
13. Enhancement/Rehab		N	N	N	N	N			
14. Streambank Veg.		1-3,5	1-5	1,3,5	1,3-5	1-5			
15. Upper Bank a. Left		32	12	18	5	4			
b. Right		8	8	24	25	25			
b. indic Left		N	N	N	N	N			
Right		N	N	N	N	N			
c. veg Left		N	N	N	N	N			
Right		N	N	N	N	N			
16. Lower Bank Left		SS	U	U	SS	GS			
Right		U	GS	U	U	GS			
17. Stab rating Left		1(2)	1(1)	1(1)	1(1)	1(1)			
Right		2(1)	1(2)	2(1)	1(1)	1(2)			
18. Stream Canopy Cover		3	3	3	3	2			
19. Fish Species	SS	1	N	N	N	N			
	CT	2	2	N	N	N			
	juv. DV	N	N	N	N	N			
	adult DV	2	N	N	N	N			
	CO	N	N	N	N	N			
20. Sampling		N	N	N	N	N			

## 21. Comments

Section 9: 14m; Passable debris jam.  
 20m; Beaver sign observed.  
 64m; 2 adult DV observed in pool.  
 92m; Stream forks, Area B, enters main stem via left bank and represents approximately 50% of the flow.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 10: Habitat change; channel width is greatly reduced, section is primarily composed of pools interconnected by short gravel/cobble riffles.

36m; Passable debris jam.

48.5m; Decreasing gradient and flow.

70m; Instream forbes common; timber becoming scrubby and channel sinuosity increasing.

Section 11: Substrate change; no ASA, pools, cobbles, and instream skunk cabbage are characteristic. Small, isolated upper bank muskeg pools common.

77m; Heavy blowdown across stream for 17 meters.

Section 12: Moderate moss coverage throughout.

45m; Old beaver sign observed.

50m; Instream blue clay deposit, 1m by 1m.

90m; Instream blowdown, 10 meters.

Section 13: 16m; Flow/gradient decreasing.

46m; Section and survey terminate at the base of a 1.3 meter high beaver dam in good repair. No fish were observed within the extensive impoundment.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - East #2 Area B ADF&G Catalog No. 106-41-22

1. Section No.		1	2	3	4	5	6	7
2. Compass Bearing		337	356	9	21	39	324	16
3. Gradient		~3.5	~4	~3	~7	~5	~10	3
4. Temperature: Air		11.5	11	11	11	12	12	12
	Water	10.5	10.5	10.5	10.5	10.5	10.5	11.5
5. Water qual:	a. color	3	3	3	3	3	3	3
	b. turbidity	1	1	1	1	1	1	1
	c. pH	6.7	6.7	6.7	6.7	6.7	6.7	6.3
6. Streambottom	Substrate	1	8	--	20	20	25	20
		2	10	12	30	20	20	10
		3	55	55	30	25	20	15
		4	20	25	14	17	15	10
		5	5	5	6	3	13	15
		6	--	--	--	--	--	--
		7	b)2	b)1c)2	--	a)15	a)5b)2a)30	a)5c)5
7. ASA	a. percent	--	7	1	1	--	--	1
	b. quality	--	1	1	1	--	--	1
8. Water Width	a. channel	3.8	2.7	2.7	2.5	2.5	2.7	2.74
	b. water	~1	~1.3	~1	~1	~.5	~1	~1
	c. floodplain	1	2	2	1	1	1	1
9. Stream Pools	a. percent	45	50	40	25	50	25	40
	b. category	SS	SS/DS	SS	SS	SS	SS	SS
10. Rearing Area		45	50	40	20	25	20	30
11. Debris Loading		5	10	7	5	10	12	10
12. Potential Barriers		N	N	N	N	N	N	N
13. Enhancement/Rehab		N	N	N	N	N	N	N
14. Streambank Veg.		1-3,5	1,3,5	1-5	1-5	1-5	1,3,5	1,3-5
15. Upper Bank	a. Left	6	12	17	22	13	84	20
	b. Right	3	45	8	12	6	26	43
	b. indic							
	Left	N	N	N	N	N	N	N
	Right	N	N	N	Y	N	N	N
	c. veg							
	Left	N	N	N	N	N	N	N
	Right	N	N	N	N	N	N	N
16. Lower Bank	Left	SS	GS	SS	U	U	SS	SS
	Right	U	U	GS	GS	U	SS	U
17. Stab rating	Left	1(1)	1(2)	1(1)	2(1)	1(2)	1(3)	1(1)
	Right	1(1)	2(1)	1(1)	1(2)	1(2)	1(2)	1(1)
18. Stream Canopy Cover		2	2	2	2	2	2	2
19. Fish Species	SS	N	2	N	N	N	N	N
	CT	1	2	N	N	N	N	N
	DV	N	N	N	N	N	N	N
20. Sampling		N	Y	N	N	N	N	N

## 21. Comments

Area B converges with the main stem, Section 9: 92m, via the left bank.  
 Section 1: Channel is sinuous and algae is dense throughout.  
 Section 2: 15m; Instream blue clay deposit, 2m, left bank.  
 65m; Instream blowdown, 10m.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 3: 50m; Instream blue clay deposit, 7m, right bank.  
75m; Instream blue clay deposit, 5m, left bank.  
80m; Instream blue clay deposit, 2m by 2m, left bank.

Section 4: Habitat change; nearly continuous boulder/cobble riffles.  
Muskeg seeps common.  
1m; Instream blue clay deposit, 1 meter, left bank.  
40m; Bedrock/boulder cascade, 10 meters long by 2 meters high.  
85m; Bedrock/boulder cascade, 10 meters long

Section 5: Timber becoming scrubby, muskeg seeps, moss and forbes common.  
45m; Instream blue clay deposit, 6 meters, right bank.  
71m; Passable debris jam.

Section 6: Dense deciduous and forb growth over stream throughout. Muskeg seeps and patchy blowdown common.  
33m; Instream blue clay deposit, 6 meters, left bank.  
69m; Passable bedrock falls, 12% gradient.

Section 7: 66m; Section and survey terminate at the base of a 2 meter high beaver dam in good repair. 28 meters above end of survey, a 2 meter high by 35 meter wide beaver dam in good repair, impounds the headwaters forming an extensive pond/marsh system. No fish were observed within the impoundments.

## FISH SAMPLING FORM

Stream Name Red Bay - East #2 ADF&G Catalog No. 106-41-22 Date 9/20/82

Identify Survey Area A Water Temp. 10°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0930	1445	0	--	Trap set in Section 3, 3m along left bank in pool.
2	1020	1430	1 - CT 1 - CO	-- --	Trap set in Section 7, 4m along left bank behind root wad.

This form is used to record fish caught during Level Three, Four, or Five Surveys.



# FISH SAMPLING FORM

Stream Name Red Bay - East #2 ADF&G Catalog No. 106-41-22 Date 9/20/82

Identify Survey Area B Water Temp. 10.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1245	1410	2 - SS	88, 48	Trap set in Section 2, 2 meters along left bank under cut bank.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# FIELD GUIDE - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 230.41.

1. Survey Areas A
2. Equipment N/A
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Red Bay - East #3
2. ADI&G Catalog No. N/A
3. Lat. 56°18'25"
3. Long. 133°18'55"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No.
8. Bay/Drainage Red Bay
9. Access 4
- 6 6
10. Camping 4
11. Present Land Use a. None
- 11b. Game trails
12. Historical Land Use Old beach accessed logging unit.
13. Stream Origin 3 4 5 6
14. Flow Stage 1
15. Flow method, width, depth, length, constant, time, estimated, 1.0 cfs, grid, flow
16. Temp. Sensitivity N/A
17. Beaver 5
18. Type aquatic Veg. 1
19. Density Aquatic Veg. 1
20. Adult Salmon No
21. Intertidal a. gradient N/A
- b. bottom type % fines N/A %
- c. ASA N/A
- gravel small cobble N/A %
- d. schooling N/A
- large cobble/boulders/bedrock N/A %
- e. shellfish N/A
- f. Anchorage in Red Bay. Extensive intertidal zone near mouth.
22. Comments  
Intertidal parameters unavailable due to high tide. A small, steep, cut-over stream draining into the northern portion of 106-41-22's intertidal zone. Rearing habitat common in the many small isolated pools; however, no ASA was observed. No fish sighted.
23. Investigators Mickowski/Merrigan
24. Date 9/20/82
25. Time 1600 1630
- start end
26. Weather 2
27. Photos

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LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Red Bay - East #3

ADF&G Catalog No. N/A

1. Section No.		1						
2. Compass Bearing		5						
3. Gradient		~ 7						
4. Temperature: Air		13						
Water		10						
5. Water qual: a. color		3						
b. turbidity		1						
c. pH		5.6						
6. Streambottom Substrate	1	5						
	2	5						
	3	30						
	4	35						
	5	15						
	6	--						
	7	5	5					
7. ASA a. percent		--						
b. quality		--						
8. Water Width a. channel		~ 1						
b. water		~ .5						
c. floodplain		2						
9. Stream Pools a. percent		65						
b. category		SS						
10. Rearing Area		55						
11. Debris Loading		40						
12. Potential Barriers		N						
13. Enhancement/Rehab		N						
14. Streambank Veg.		1-3, 5						
15. Upper Bank a. Left		5						
b. Right		15						
b. indic Left		N						
Right		N						
c. veg Left		N						
Right		N						
16. Lower Bank Left		GS						
Right		GS						
17. Stab rating Left		1(1)						
Right		1(1)						
18. Stream Canopy Cover		2						
19. Fish Species								
No Fish Observed.								
20. Sampling		N						

21. Comments

A low volume, deeply shaded stream. Channel is non-distinctive at times, running under decomposed root masses, and sporadically forming pools with nearly 100% vascular plant cover. Instream moss and muskeg "seeps" common.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

The alder canopy is nearly complete, and the understory remains fairly open with a high incidence of ferns. Rearing area is predominantly in the form of small isolated pools. Substrate varies while maintaining a high incidence of gravels; however, low flow, debris, and pooling preclude any ASA. No fish observed.

Reconnaissance beyond survey's end revealed gradients on the order of 12% and drastically reduced flow.

Part 1 - Instructions for completing this part are found in ISH 2609-23 2 10 Section 10.41.

1. Survey Area A
2. 1 at X
3. Historical Fish Species No Escapement Data Available.
4. Stream Length 100m

Part 2 - Instructions for completing this part are found in ISH 2609-23 2 10 Section 10.42.

1. Stream Name Bell Island #1
2. NAD83 Catalog No. N/A
3. Lat. 56°18'30"
4. Agency Unit 05
5. Host Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-8-101
8. Bay/Drainage Red Bay
9. Access 4
- 6 6
10. Camping 4
11. Present Land Use a. None
- 11b. Game trails
12. Historical Land Use Adjacent to an approx. 20 year old clear cut.
13. Stream Origin 3
- 4 4
- 5 5
- 6 6
14. Flow Stage 1
15. Flow estimated, <1.5 cfs  
method width depth length constant time grid flow
16. Temp. Sensitivity Low flow; muskeg source
17. Beaver 5
18. Type aquatic Veg. 1
19. Density Aquatic Veg. 3
20. Adult Salmon no
21. Intertidal a. gradient 2%
- b. bottom type % fines 10%
- c. ASA poor, low flow  
over mixed cobbles
- gravel small cobble 50%
- d. schooling high tide only/  
Red Bay
- large cobble/boulders/bedrock 30%
- e. shellfish none observed
- f. Anchorage, Red Bay

## 22. Comments

A small, sinuous, primarily muskeg drained stream located due east of the tidal slough separating the southern tip of Bell and Prince of Wales Islands. Stream drains through an approximately 75m slough to an extensive mud flat/reed grass marsh. 4 juvenile DV observed in intertidal slough, no other fish sighted. Extensive rearing areas, but minimal ASA. Highly stained and acidic flow. Channel appeared slough-like with continuous undercut banks and dense, overhanging vegetation.

23. Investigators Mickowski/Merrigan

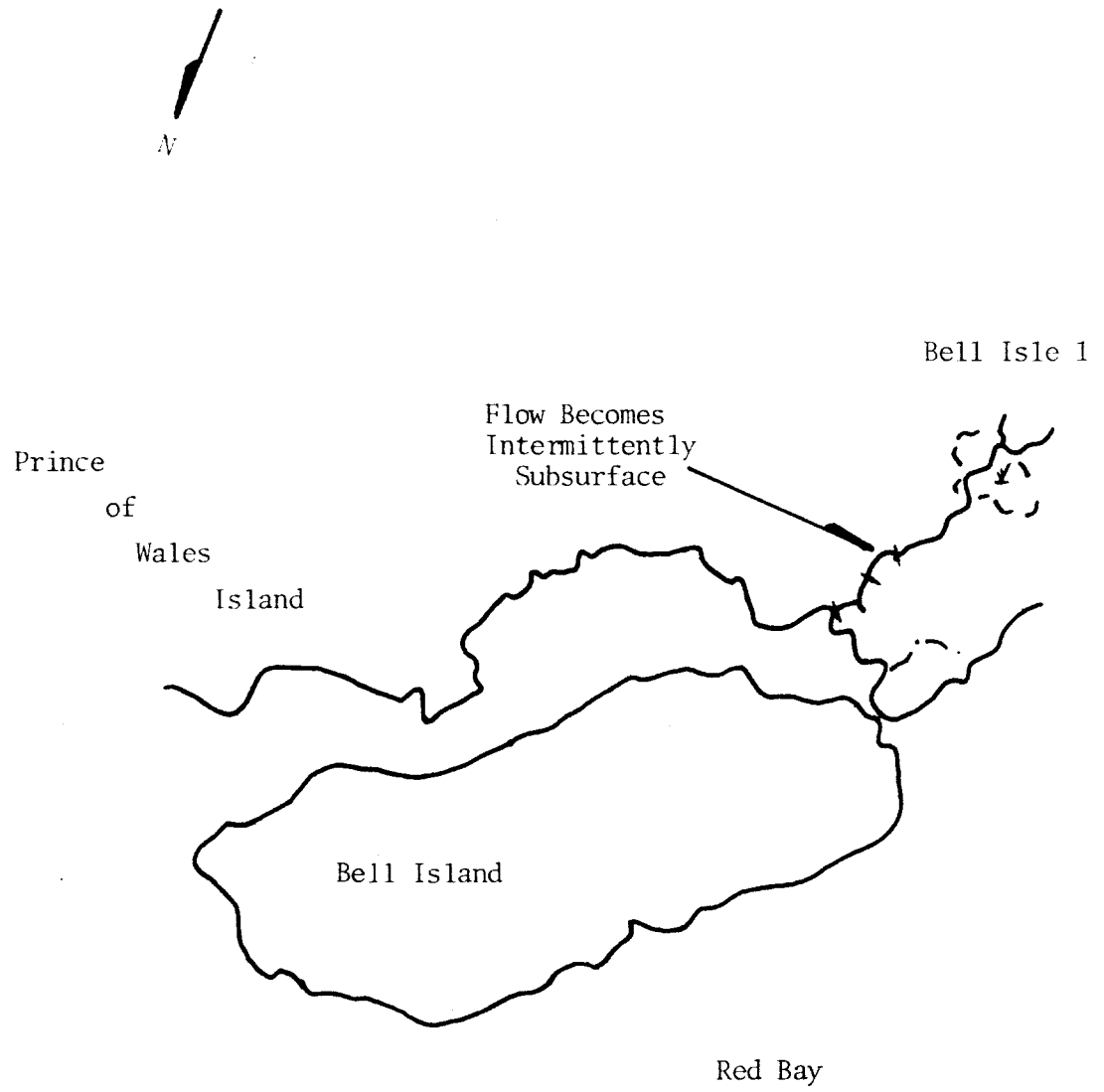
24. Date 9 / 19 / 82

25. Time 1430 1630  
start end

26. Weather 6

27. Photos

Bell Island #1



Bell Island #1



1. The ITZ Looking Toward the Stream Mouth.  
Intertidal ASA is Poor Due to Fine Substrate.

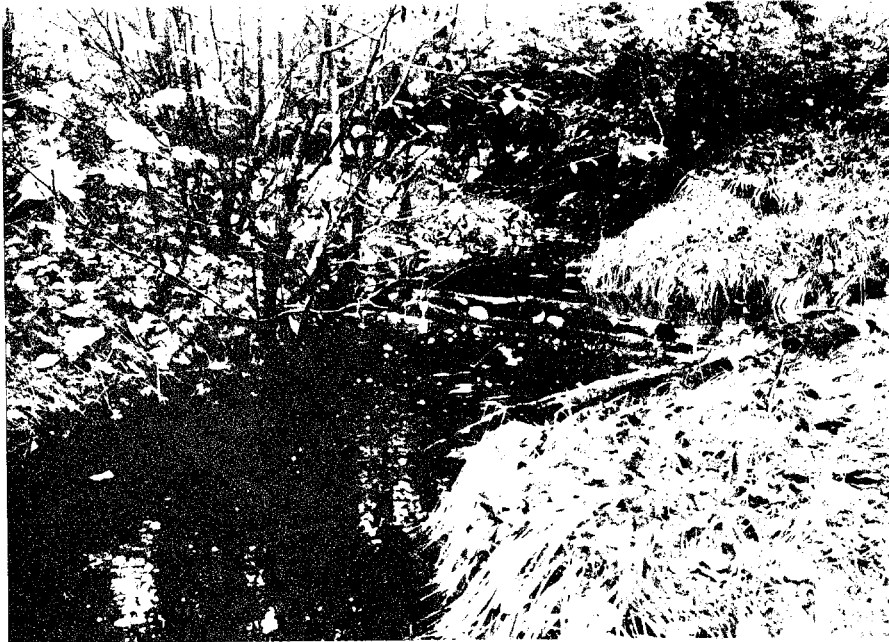


2. The ITZ Looking North Toward Bell Island. ASA  
is Poor Due to Low Flow.

Bell Island #1



3. The Upper ITZ. Low Flow Over Mixed Cobble  
Produces Marginal ASA.



4. Section 1: Low Flow and Undercut Banks  
Provide Good Rearing Habitat but Poor ASA.



Bell Island #1

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	100	1.3	2	2.6m <sup>2</sup>					

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bell Island #1

ADF&G Catalog No. --

1. Section No.	1	2					
2. Compass Bearing	96	153					
3. Gradient	~3	1.5					
4. Temperature: Air	18	18					
Water	10	10					
5. Water qual: a. color	3	3					
b. turbidity	1	1					
c. pH	6.4	6.4					
6. Streambottom Substrate	1 7	2					
	2 10	--					
	3 15	5					
	4 40	55					
	5 20	30					
	6 7	8					
	7 8	8					
7. ASA a. percent	2	--					
b. quality	1	--					
8. Water Width a. channel	~1.3	2.1					
b. water	~1.3	2.1					
c. floodplain	1	1					
9. Stream Pools a. percent	40	85					
b. category	SS	SS					
10. Rearing Area	40	90					
11. Debris Loading	15	20					
12. Potential Barriers	N	N					
13. Enhancement/Rehab	N	N					
14. Streambank Veg.	1-5	1-5					
15. Upper Bank a. Left	24	42					
b. Right	30	25					
b. indic Left	N	N					
Right	N	N					
c. veg Left	N	N					
Right	N	N					
16. Lower Bank Left	U	U					
Right	U	U					
17. Stab rating Left	1(1)	1(1)					
Right	1(1)	1(1)					
18. Stream Canopy Cover	1	3					
19. Fish Species SS	--	--					
DV	--	--					
20. Sampling	N	N					
21. Comments							

Section 1: 0m; Intertidal/fresh water interface. Dense instream moss coverage. Nearly complete herbaceous growth over channel. Continuous undercut, overhanging banks. Highly sinuous channel.

# LIVELIBRE HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.41.

1. Survey Areas A
2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

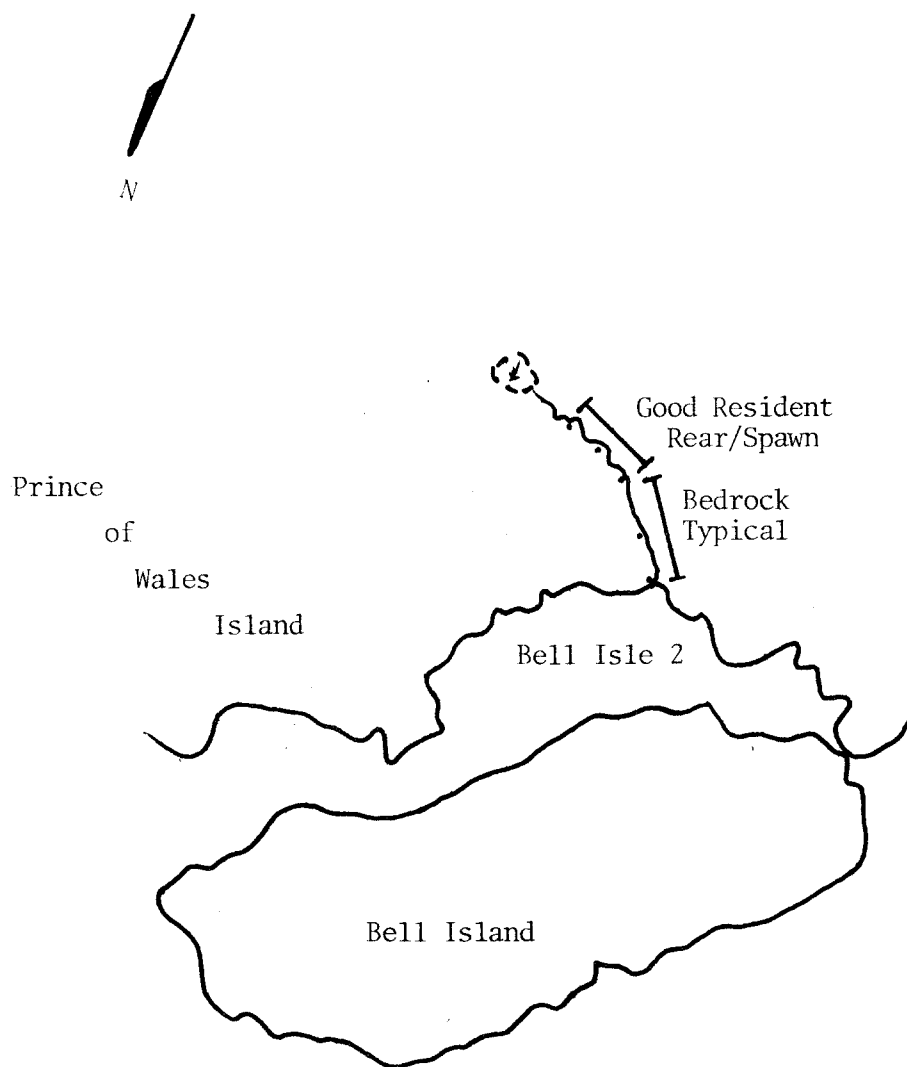
Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 330.42.

1. Stream Name Bell Island #2
2. ADP&G Catalog No. --
3. Lat. 56°18'55"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-8-101
8. Bay/Drainage Red Bay
9. Access 4
10. Camping 4
11. Present Land Use a. None
- 11b. None
12. Historical Land Use None
13. Stream Origin 3 4 5 6
14. Flow Stage 2
15. Flow method, width, depth, length, constant, time, Estimated 2.5 cfs  
grid flow
16. Temp. Sensitivity shallow water depth
17. Beaver 5
18. Type aquatic Veg. 1, 4
19. Density Aquatic Veg. 2
20. Adult Salmon N
21. Intertidal a. gradient 2.5
- b. bottom type % fines 90%
- c. ASA 10%
- gravel small cobble 10%
- d. schooling N
- large cobble/boulders/bedrock -- %
- e. shellfish N
- f. South end of Bell Is. is small boat anchorage in small cove.
22. Comments
- 21c. Excellent PS/SS ASA in upper 30m of intertidal zone in gravel riffle.

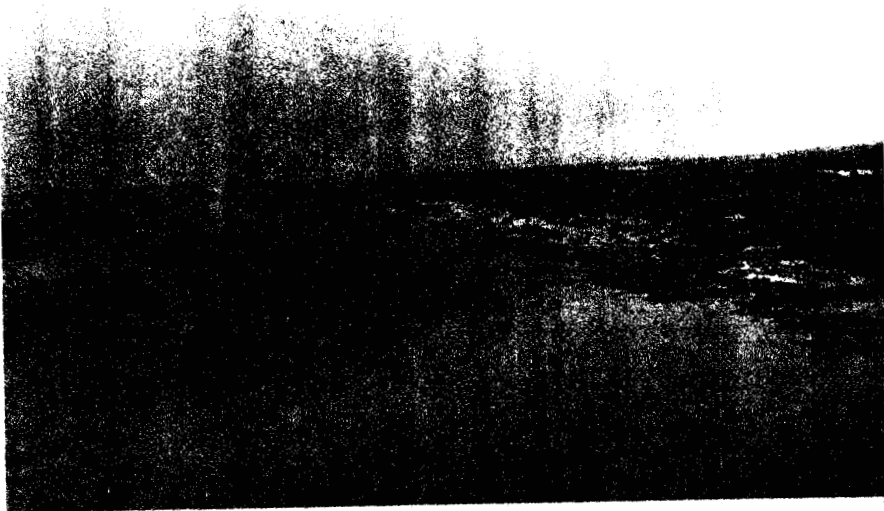
23. Investigators Murph
24. Date 9/20/82
25. Time 0840 1030  
start end
26. Weather 5
27. Photos

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Bell Island #2



Bell Island 2



1. Lower Intertidal Zone Looking Downstream (East Side of Bell Island in Background).



2. Upper Intertidal Zone Looking Upstream.

Bell Island 2



3. Section 11: 56m; Cascades Over Bedrock at the Top of the Intertidal Zone.



4. Section 3: Typical ASA/Pools of Upper Sections. Sand/Gravel Substrate in Short Riffles Between Long SS Pools.

# Bell Island #2

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1I	100	3.3	7	23.1					
2	100	2	1	2					
3	100	1.25	8	10					
4	100	2	10	<u>20</u>					
Total				55.1m <sup>2</sup>					

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bell Island #2

ADF&G Catalog No. --

1. Section No.		1I	2	3	4				
2. Compass Bearing		116	83	96	91				
3. Gradient		12	8	5	3				
4. Temperature: Air		10.5	9.5	9.5	9.5				
	Water	9.5	9.5	9.5	9.5				
5. Water qual:	a. color	3	3	3	3				
	b. turbidity	1	1	1	1				
	c. pH	--	7.5	7.5	7.5				
6. Streambottom	Substrate	1	10	10	3	--			
		2	10	15	5	--			
		3	10	15	15	15			
		4	15	10	40	35			
		5	5	10	35	45			
		6	--	--	--	--			
		7	a) 50	a) 40	b) 1 c) 1	b) 3 c) 2			
7. ASA	a. percent	7	1	8	10				
	b. quality	2	3	2	2				
8. Water Width	a. channel	14	2.7	2.0	2.3				
	b. water	3.3	2.0	1.25	2.0				
	c. floodplain	1	1	1	1				
9. Stream Pools	a. percent	40	80	75	75				
	b. category	SS/SF	SS	SS	SS				
10. Rearing Area		30	40	60	60				
11. Debris Loading		5	5	10	10				
12. Potential Barriers		N	N	N	N				
13. Enhancement/Rehab		N	N	N	N				
14. Streambank Veg.		5	1,3,5	1-5	1-5				
15. Upper Bank	a. Left	15	0	25	20				
	b. Right	10	35	10	12				
	b. indic								
	Left	N	N	N	N				
	Right	N	N	N	N				
	c. veg								
	Left	N	N	N	N				
	Right	N	N	N	N				
16. Lower Bank	Left	GS	SS	U	U				
	Right	GS	U	U	U				
17. Stab rating	Left	1(1)	2(1)	1(1)	1(1)				
	Right	1(1)	3(2)	1(1)	1(1)				
18. Stream Canopy Cover		3	2	1	2				
19. Fish Species	CT/DV	>12	>12	--	--				
20. Sampling		Y	Y	N	N				
21. Comments									

Section 1: 0m; Treeline on right bank is beginning of survey.  
62m; End of intertidal zone.



LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Stream Evaluation:

First two sections were long SS pools between cascades/falls over steeply sloping bedrock outcrops. Little ASA (all ASA in Section 11 was in intertidal zone), and moderate pool rearing. Sections 3 and 4 were lesser gradients, sand/gravel substrate, good to excellent ASA in riffles and excellent rearing in pools and undercut banks. CT and DV observed; no SS trapped or observed. Due to lack of time, survey ended with Section 4, though good to excellent habitat continued above.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2: 8m; Flow becomes intermittently subsurface. Continuous undercut, overhanging banks. Nearly complete herbaceous canopy, dense instream vascular plant colonization. Sporadic blowdown. Highly sinuous channel. Muskeg "ponds" common along both banks.  
100m; End of survey.

By end of survey, flow had decreased approximately 20% and gradients to 15% were observed beyond. Overall, a marginal fish stream at best.

## FISH SAMPLING FORM

Stream Name Bell Island #2 ADF&G Catalog No. -- Date 9/20/82  
Identify Survey Area A Water Temp. 9.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0910	1030	0	--	Section 1I in intertidal pool. Fish observed.
2	0920	1010	0	--	Section 2, 5m, pool under root wad.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL 101E - HABITAT SURVEY FORM (Parts 1 and 2)

Part 1 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 350.41.

1. Survey Areas A, B
2. Equipment X
3. Historical Fish Species No Escapement Data Available.
4. Section Length 100m

Part 2 - Instructions for completing this part are found in FSH 2609.23 R-10 Section 350.42.

1. Stream Name Bell Island #3
2. ADP&G Catalog No. --
3. Lat. 56°19'05"
3. Long. 133°17'45"
4. Agency Unit 05
5. Mgmt Area 532 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 71-18-8-101
8. Bay/Drainage Red Bay
9. Access 4
- 5 5
10. Camping 4
11. Present Land Use a. none observed
- 11b. game trails
12. Historical Land Use 20 year old beach logging on left side for first 70m of survey.
13. Stream Origin 3 4 5 6
14. Flow Stage 2
15. Flow method, width, depth, length, constant, time, estimated, grid, flow
15. Flow estimated <5 (~1.0 cfs)
16. Temp. Sensitivity None
17. Beaver 5
18. Type aquatic Veg. 1, 2
19. Density Aquatic Veg. 2
20. Adult Salmon N
21. Intertidal a. gradient 2.0
- b. bottom type % fines 55%
- c. ASA 15%
- gravel small cobble 40 %
- d. schooling Y
- large cobble/boulders/bedrock 5%
- e. shellfish N
- f. Off mouth of creek behind Bell Is. during high tide, or off north end of Bell Is.
22. Comments
- 21c. Good ASA in upper 200m of intertidal zone for coho and pink salmon, though low flows and heavy silt/sand account for lower percent rating.

23. Investigators Murph/Mickowski/Merrigan

24. Date 9/21/82

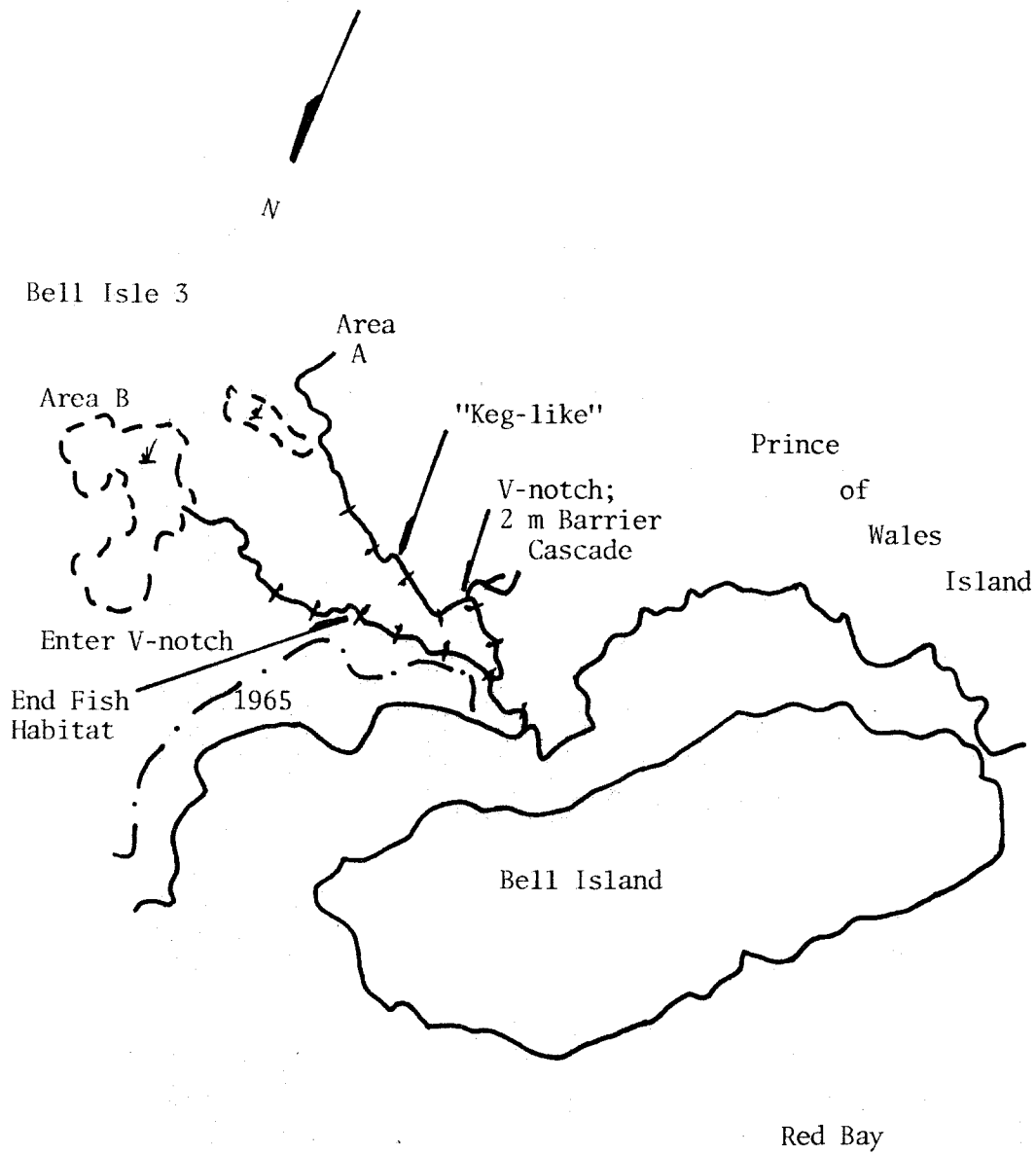
25. Time 1520 1730  
start end

26. Weather 2

27. Photos \_\_\_\_\_

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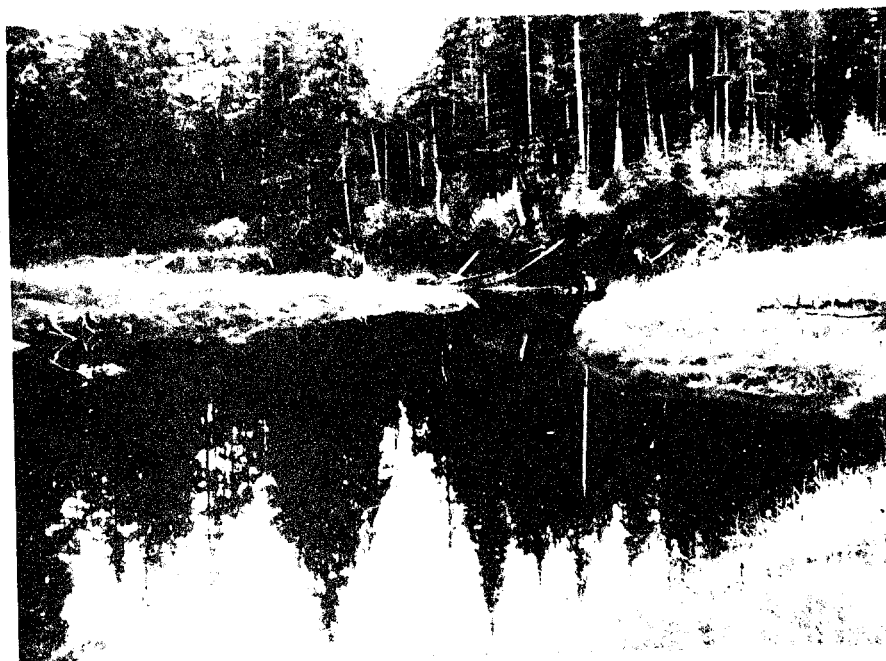
Bell Island #3



Bell Island 3  
Survey Area "A"



1. Lower Intertidal Area Looking out to Sumner Straits and the Mouth of Red Bay (North End of Bell Island on Left.)



2. Middle Intertidal Area Looking Upstream into Lagoon and Timber.

Bell Island 3  
Survey Area "A"

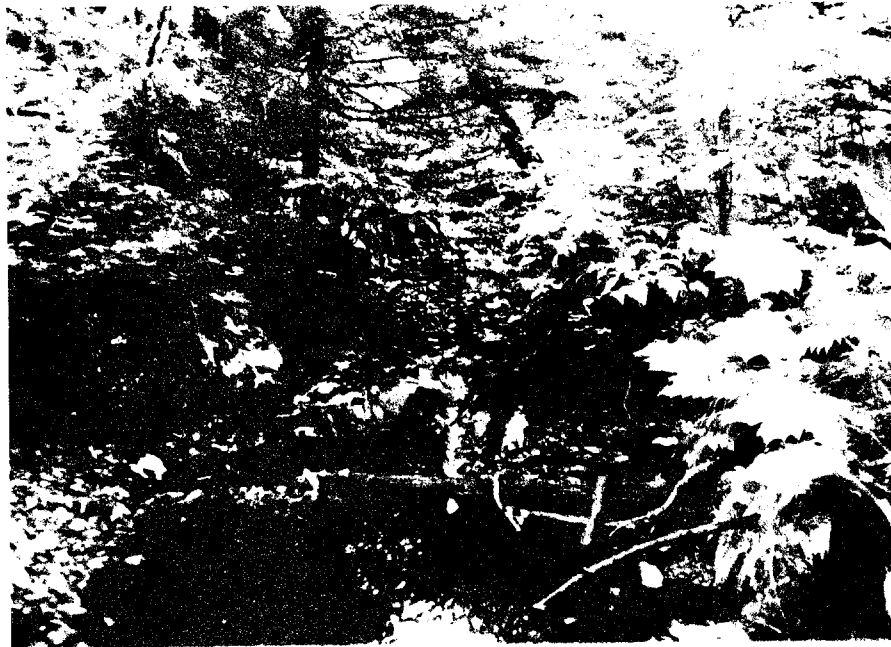


3. Section 11; 87m: Mouth of Tributary as It  
Converges With the Main Stem.



4. Section 3 Substrate Change to Bedrock/Boulder/  
Cobble and Moderate Gradients (Approximately  
5%). Heavy Moss on Exposed Boulders.

Bell Island 3  
Survey Area "B"



5. Section 2: Gravel/Cobble Riffles and Pools  
Typical of Stream Habitat.



6. Section 4: Three Foot Falls Over Sunken Debris;  
Common Throughout Survey Area.



# Bell Island #3

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Area A					Area B				
1I	100	7.5	5	37.5	1I	100	1.0	5	5
2I	100	2.85	4	11.4	2I	100	2.7	5	13.5
3	100	2.7	1	<u>2.7</u>	3	100	2.5	3	<u>7.5</u>
Total				51.6m <sup>2</sup>	Total				26.0m <sup>2</sup>

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bell Island #3 ADF&G Catalog No. --  
 Survey Area "A" Main Stem 21

1. Section No.	11	2	3	4	5	6	
2. Compass Bearing	75	37	103	58	101	203	
3. Gradient	1	2.5	5	15	12	27	
4. Temperature: Air	12	12	12	12	12	12	
Water	10	10	10	10	10	10	
5. Water qual: a. color	3	3	3	3	3	3	
b. turbidity	1	1	1	1	1	1	
c. pH	--	7.2	7.2	7.2	7.5	7.5	
6. Streambottom Substrate	1	1	3	20	15	20	
	2	--	--	15	10	20	
	3	10	10	15	10	25	
	4	75	60	15	8	15	
	5	14	20	12	3	--	
	6	--	--	--	--	--	
	7	--	a) 7	a) 20 c) 3	a) 40 b) 1	a) 60 b) 1	a) 20
7. ASA a. percent	5	4	1	--	--	--	
b. quality	1	1	1	--	--	--	
8. Water Width a. channel	9.2	5.0	5.0	2.64	4.2	2.03	
b. water	7.5	2.85	2.7	1.3	2.3	1.75	
c. floodplain	2	2	2	1	1	1	
9. Stream Pools a. percent	90	80	20	20	18	30	
b. category	SS	SS	SS	SS/SF	SS/SF	SS/SF	
10. Rearing Area	35	50	20	10	9	15	
11. Debris Loading	3	4	4	4	3	9	
12. Potential Barriers	N	N	N	Y	N	N	
13. Enhancement/Rehab	N	N	N	N	N	N	
14. Streambank Veg.	1,3,5	1,3,5	1,2,5	1-3,5	1,3,5	1,3-5	
15. Upper Bank a. Left	41	17	5	35	55	5	
b. Right	5	4	2	38	35	45	
b. indic Left	N	N	N	N	N	N	
Right	N	N	N	N	N	N	
c. veg Left	N	N	N	N	N	N	
Right	N	N	N	N	N	N	
16. Lower Bank Left	U	SS	U	U	SS	U	
Right	U	GS	GS	U	U	U	
17. Stab rating Left	1(2)	1(2)	1(2)	1(3)	1(2)	2(2)	
Right	1(1)	1(1)	2(2)	1(2)	1(2)	2(2)	
18. Stream Canopy Cover	3	3	2	3	2	2	
19. Fish Species juveniles SS	0	>25	<6	0	0	0	
20. Sampling	N	N	Y	Y	N	N	

## 21. Comments

Section 11: 0m; Intertidal zone where stream makes large bend to right (from 341° to 75°) with grass flats on right and trees on undercut bank on left. Begin clearcut on left side.  
 87m; Tributary joins main stem, survey area "B".

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 2I: 20m; 4m of bedrock on right side.  
72m; Bedrock substrate; end intertidal.  
96m; End of bedrock; end of unit on right side; increasing sinuosity.

Section 3: 40m; Increasing gradient.  
56m; 6m of bedrock substrate.  
80m; Beginning of cascades over bedrock substrate.

Section 4: 2m; 2m cascade barrier without jumping/holding pool below.  
2-92m; A series of cascades/pools in a V-notch with increasing gradient, and bedrock substrate. A potential barrier.

Section 5: 15-56m and 75-94m; Series of cascades over bedrock.

Section 6: 0m; Stream character becomes "muskeg" like with low gradient, grass/forbes on banks, sinuous and low flow.  
70-87m; Cascade over bedrock.  
87m; Resumes "muskeg" character.

Stream Evaluation:

First two sections contained some fair ASA (low % due to silting and flows) and excellent rearing area. Above intertidal zone the substrate changed to bedrock/boulder/cobble and increasing gradients. Numerous muskeg seeps with heavy skunk cabbage growth, and long series of continuous bedrock/boulder cascades in V-notch area (potential barriers). The stream character changes again at 500m to decreasing gradient, muskeg stream with isolated muskeg ponds on both banks after leaving V-notch. Survey ended due to lack of habitat.

# LEVEL THREE - HABITAT SURVEY FORM (Part 3)

Stream Name Bell Island #3

ADF&G Catalog No. --

Survey Area "B" : Tributary (on left in intertidal)

1. Section No.		11	2	3	4	5	6		
2. Compass Bearing		166	78	86	105	123	45		
3. Gradient		13	6	8	12	15	10		
4. Temperature: Air		12	12	12	11.5	11.5	11.5		
	Water	10	10	10	10	10	10		
5. Water qual:	a. color	1	1	1	1	1	1		
	b. turbidity	1	1	1	1	1	1		
	c. pH	7.5	7.5	7.5	7.5	7.5	7.5		
6. Streambottom Substrate	1	10	25	30	35	30	25		
	2	15	15	20	20	15	10		
	3	20	20	20	15	10	15		
	4	15	25	15	20	5	10		
	5	4	10	5	5	--	--		
	6	--	--	--	--	--	--		
	7	a) 36	b) 5	a) 10	a) 15	a) 40	a) 40		
7. ASA	a. percent	5	5	3	0	0	0		
	b. quality	3	2	3	--	--	--		
8. Water Width	a. channel	4.8	2.9	7.2	2.6	3.6	3.1		
	b. water	.7/.3	2.7	2.5	2	2.7	1.7		
	c. floodplain	3	2	2	2	1	2		
9. Stream Pools	a. percent	25	40	30	10	10	15		
	b. category	SS	SS/DS	SS/DS	SS/SF	SS/DS	SS/DS		
10. Rearing Area		20	45	25	5	5	5		
11. Debris Loading		5	15	5	8	3	8		
12. Potential Barriers		N	N	N	N	N	N		
13. Enhancement/Rehab		N	N	N	N	N	N		
14. Streambank Veg.		5	1-5	1-5	1-5	1-5	1,3-5		
15. Upper Bank	a. Left	0	16	18	18	62	9		
	b. Right	0	9	15	3	54	19		
	b. indic								
	Left	N	N	N	N	V-not	N		
	Right	N	N	N	N	Y	N		
	c. veg								
	Left	N	N	N	N	V-not	N		
	Right	N	N	N	N	N:bdrk	N		
16. Lower Bank	Left	U	SS	U	U	GS	U		
	Right	GS	U	GS	SS	SS	U		
17. Stab rating	Left	1(1)	1(1)	3(1)	2(1)	2(2)	2(1)		
	Right	1(2)	1(1)	1(2)	1(1)	1(3)	2(1)		
18. Stream Canopy Cover		3	1	1	2	1	2		
19. Fish Species	DV	--	--	6	--	--	<6		
	CT/DV	--	<6	--	--	>6	--		
20. Sampling		N	N	N	N	N	N		
21. Comments									

Section 11: 0m; Confluence with left side of main stem in Section 11, 87m of Survey Area "A".  
 27m; End intertidal zone.  
 28.5m; Stream enters treeline.  
 47-73m; Cascade over bedrock in small V-notch.

LEVEL THREE - HABITAT SURVEY FORM (Part 3)

21. Comments Cont.

Section 3: 23m; Muskeg seep on left side.  
74-84m; Cascade over bedrock.

Section 4: 43-72m; Cascades over 10% gradient with boulder/large cobble/  
bedrock substrate in V-notch.  
72m; 1m falls onto rocks.

Section 5: 0-63m; Cascades over bedrock and boulders with .3-.5m falls  
at 63m.  
81m; End V-notch.

Section 6: 2m; Muskeg seep on right side with less than .5 cfs flow and  
heavy rust bacterium.  
4.5-17m; Cascade over bedrock.  
42-54m; Blowdown over stream.

Stream Evaluation:

This stream is characterized by steep gradients, V-notch sections with 10 to 20m long cascades/falls over bedrock and boulders interspersed with fast flows over boulder/large cobble substrate; generally poor salmon habitat. ASA is low due to the large size (5-10 inches) and compactness of substrate. Poor rearing area due to fast flows and lack of debris cover in majority of stream with good rearing in intermittent deep, slow pools near boulders. Survey was ended due to lack of habitat.

## FISH SAMPLING FORM

Stream Name Bell Is. #3 ADF&G Catalog No. -- Date 9/21/82

Identify Survey Area A Water Temp. 10.0°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1605	1720	4 - SS	79mm 78mm 63mm 55mm	Section 3, 3m.
2	1620	1705	0	--	Section 4, 28m.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## LEVEL TWO HABITAT SURVEY

### Part I.

1. Survey Areas A 2. Section Length 100-500m  
 3. Historical Fish Species no escapement data available

### Part II.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21  
 3. Latitude 56°19'28" Longitude 133°16'52"  
 4. Agency Unit 05 5. Mgmt. Area 532 K 6. USGS Map No. Petersburg B-4  
 7. Aerial Photo No. 81-18-1379-79; 81-19-1379-84/85/86  
 8. Bay/Drainage Summer Strait 9. Access 2  
 10. Present Land Use none  
 11. Historical Land Use logging  
 12. Stream Origin 3-6 13. Estimated Flow 10 cfs 14. Flow Stage 2.5  
 15. Stream Temperature 7.5 16. pH 8.0 17. Beaver yes  
 18. Temperature Sensitivity no  
 19. Barrier no 20. Weather 1

### Part III.

#### 21. Intertidal

- A. Substrate: Fines 15 % Gravel/S. Cob. 70 %  
 L. Cob/Boulder/Bedrock 15 %  
 B. Gradient 1 %  
 C. ASA % 10 - fair  
 D. Schooling IT pools and high tide only; moderate overall  
 E. Shellfish moderate  
 F. Anchorage Red Bay for vessel; mouth for skiff

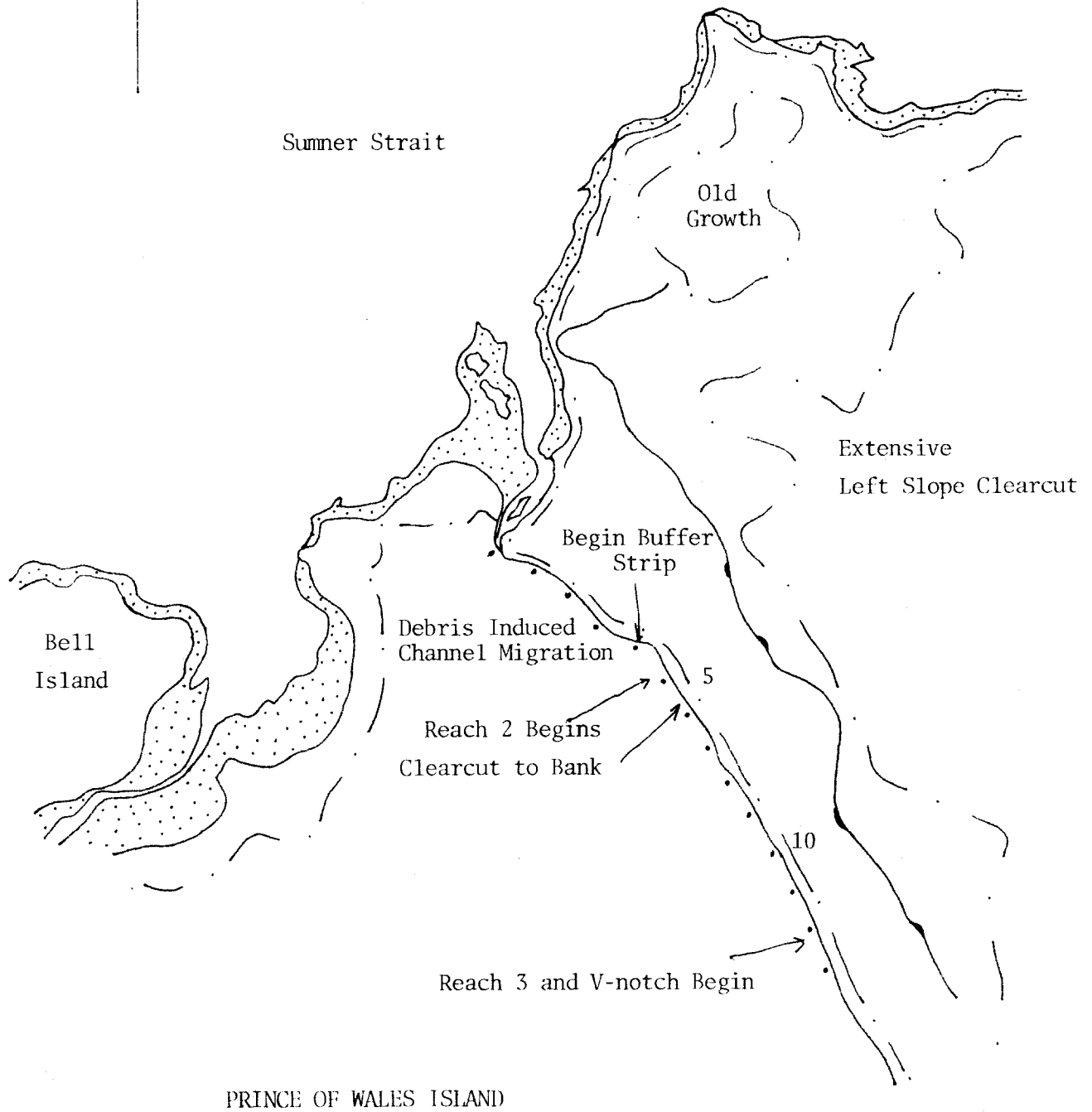
#### 22. Comments Stream Evaluation

This straight, moderately sized stream is characterized by beaver impounded headwaters, an extensive cobble/boulder V-notch section and a highly disturbed segment typified by channel migration, logging debris, and blowdown. Moderate to heavy debris loading occurred throughout Reach 1 and the first three sections of Reach 3, a result of logging debris and blowdown. Large organic debris enhanced rearing by pooling flow, effectively nullifying steep channel gradients. ASA was concentrated in Reach 1, a result of increasing channel gradient and substrate size, demarcating Reach 2. Channel becomes a boulder/cobble matrix and cuts a deep notch with the advent of Reach 3. ASA remains isolated throughout, however rearing habitat availability fluctuated with debris input. Fish sighting though infrequent occurred throughout survey. No enhancement or rehabilitation recommended.

23. Investigators Ted Mickowski 24. Date 5/18, 25, & 9/27/83  
 Survey observations were hindered by high flows and "dark" water.

N

106-41-21  
Pine Creek







106-41-21  
Pine Creek

Blowdown;  
Induced Side  
Slope Failure

PRINCE OF WALES ISLAND

18

19

21

Muskeg Lake

Channel Remains Incised;  
However Gradient Moderates

24

9/27/83 Sub  
Sample Survey  
Begins

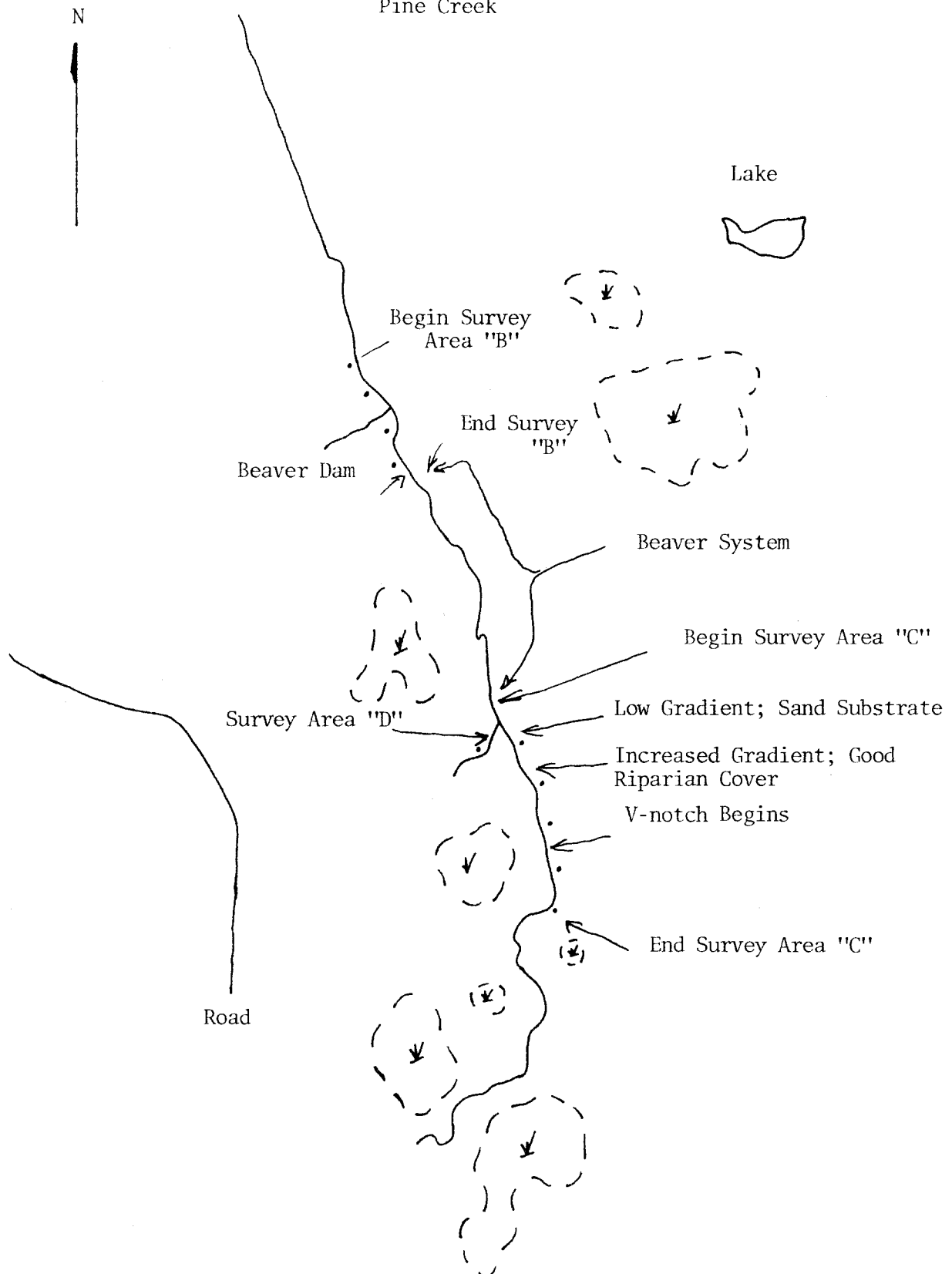
25

Incised Channel;  
Bank Instabilities  
Common

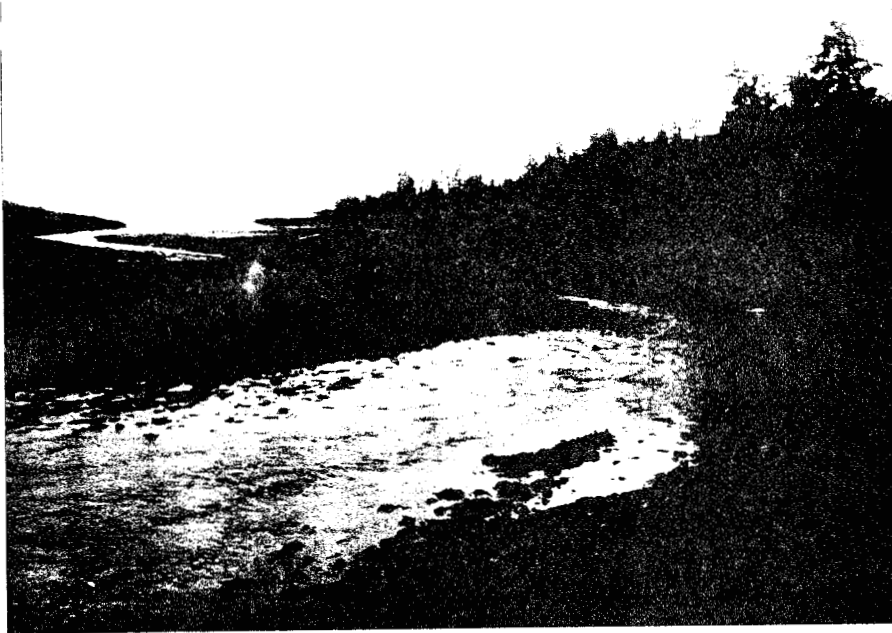
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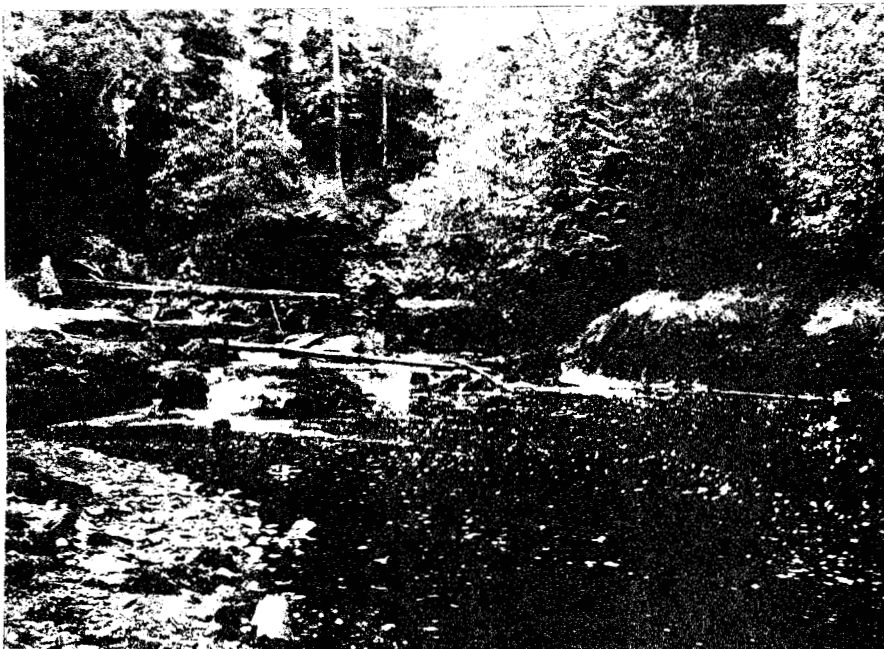
106-41-21  
Pine Creek



Pine Creek  
106-41-21  
Survey Area "A"

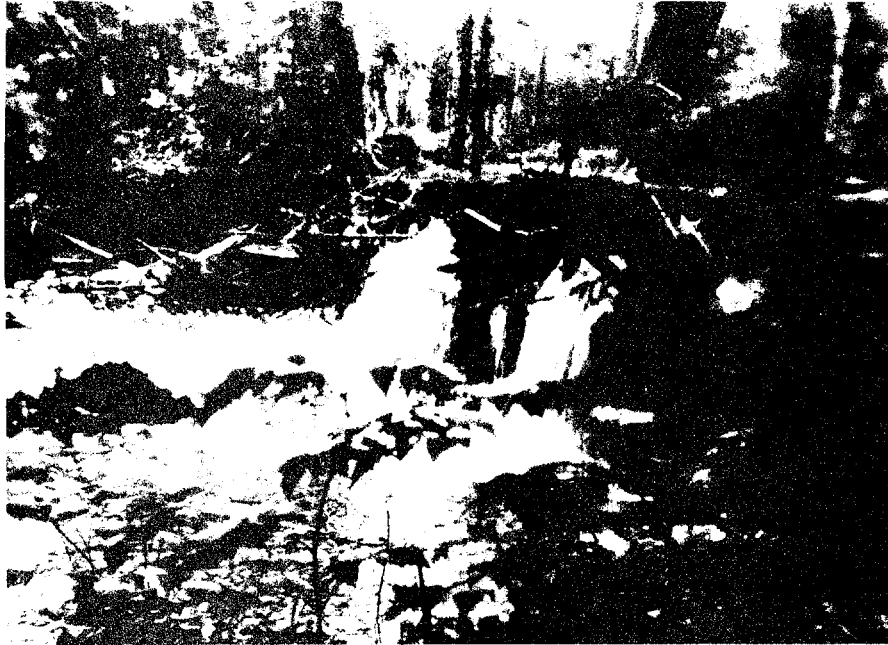


1. Downstream view of lower ITZ looking toward Summer Strait.

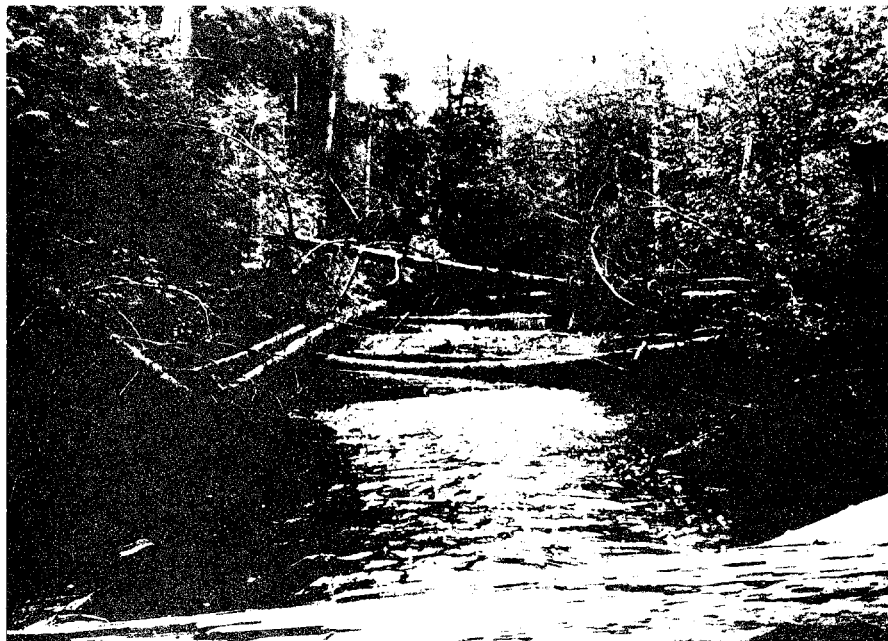


2. Upper ITZ with tidal rapids over bedrock.

Pine Creek  
106-41-21  
Survey Area "A"



3. Section 3: Several intact beaver dams redirect flow and provide impoundment rearing.



4. Section 13: Numerous side slope failures and heavy blowdown within notch, generates copious instream debris/jams.

Pine Creek  
106-41-21  
Survey Area "A"

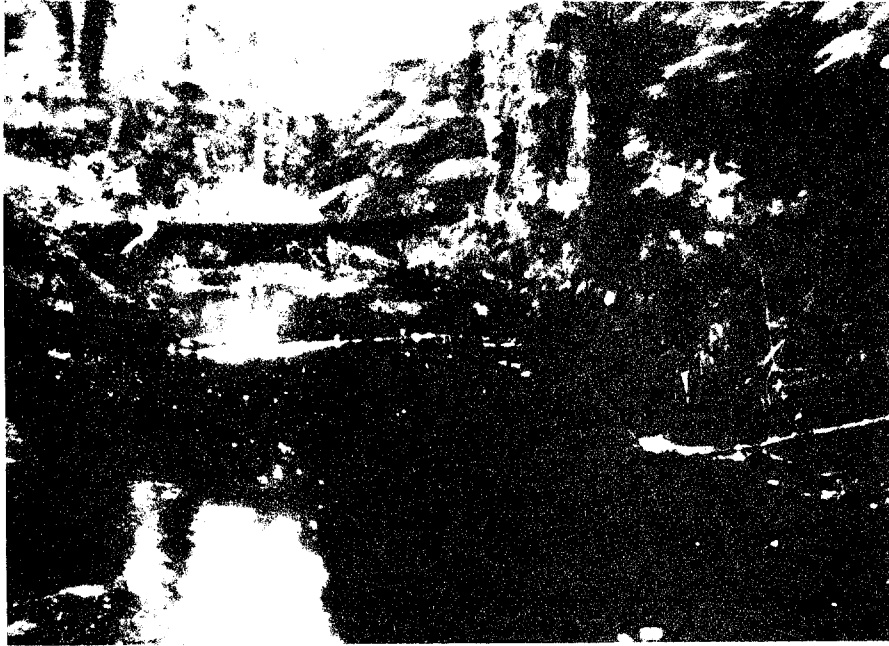


5. Section 18: Steep channel gradient and coarse substrate provide sporadic, marginal rearing and no ASA. Blowdown and side slope failures common.



6. Section 25: Cobble/boulder V-notch continues. Numerous instream logs/stair step cascades. Rearing habitat extremely limited and no ASA observed. Blowdown and side slope instabilities common.

Pine Creek  
106-41-21  
Survey Area "B"



1. Section 1: 0m; Steep side slopes with boulder/cobble substrate.

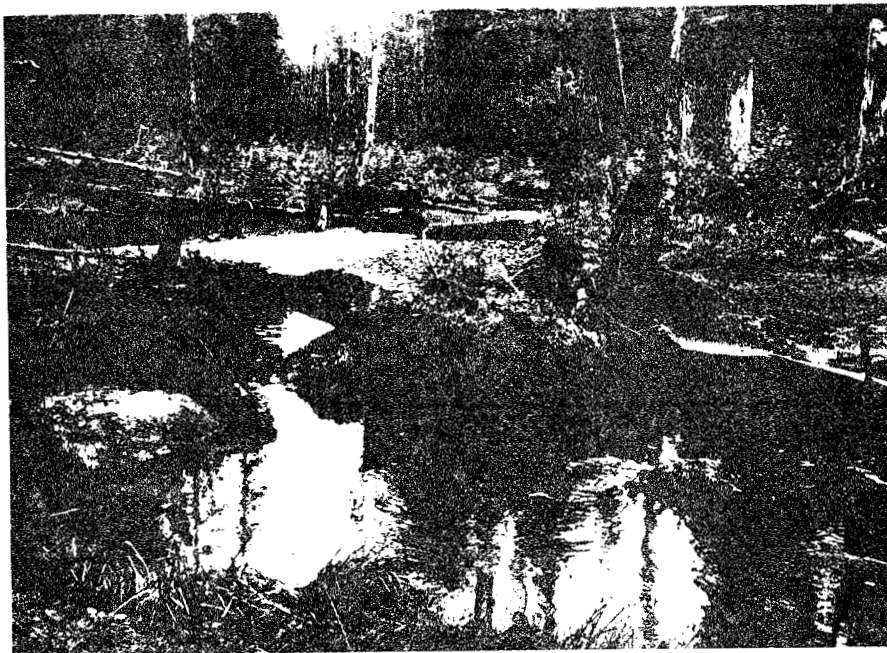


2. Beaver dam (2.0 x 25m) Section 4: 50m.

Pine Creek  
106-41-21  
Survey Area "C"



1. A large beaver system just below Survey Area "C".



2. The stream cuts a channel through an old, degenerated beaver pond at the beginning of Section 1, Survey Area "C".



Pine Creek  
106-41-21  
Survey Area "C"



3. Survey Area "C": The substrate size increases to large cobble and boulder composition in Section 5 as the stream travels through a V-notch.



4. Aerial reconnaissance above Area "C" revealed an extensive series of beaver impoundments. No barriers were observed suggesting anadromous use is likely. Note active beaver dam, bottom left.



Pine Creek  
106-41-21  
Survey Area "D"



1. The mouth of Survey Area "D" taken from Section 1 of Survey Area "C".



2. Survey Area "D" provides good fish habitat near the confluence but soon deteriorates moving upstream.

Pine Creek  
106-41-21

Section	Length (m)	Width (m)	ASA b	ASA Total	Section	Length (m)	Width (m)	ASA b	ASA Total
1	100	6.0	15	90.0	Survey Area "C"				
2	100	7.8	15	117.0	1	100	4.2	5	21.0
3	100	4.3	5	21.5	2	100	4.7	5	23.5
4	100	10.2	10	102.0	3	100	2.8	3	8.4
5	100	8.5	5	42.5	4	100	6.1	5	30.5
6	100	8.5	5	42.5	5	100	2.8	2	5.6
11	100	5.5	3	16.5	Total				89.0m <sup>2</sup>
13	100	10.5	8	84.0	Survey Area "D"				
14	100	10.5	12	126.0	Total	100	2.0	3	6.0m <sup>2</sup>
15	100	7.6	5	38.0					
17	100	9.4	1	9.4					
19	300	11.0	1	11.0					
21	200	6.4	3	19.2					
22	200	9.6	5	48.0					
23	100	8.6	3	25.8					
24	200	9.0	10	90.0					
Total				883.4m <sup>2</sup>					

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21

Reach Number	1	1	1	1	2	2	2
1. Section Number	1	2	3	4	5	6	7
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	101	153	150	116	130	129	151
4. Gradient	1.0	1.0	4.0	2.0	2.5	2.5	2.5
5. Water Quality	1	1	1	1	1	1	1
6. Bank Type	B	B	D	D	B	B	B
7. Bank Stability	1/1	1/1	2/1	2/1	1/1	1/1	1/1
8. Bank Vegetation	1-3,5	1-3,5	1-5	1-5	1-5	1-3,5	1-5
9. Debris Loading	3	6	20	15	2	2	4
10. Undercut Bank Length	--	--	20	15	20	10	5
11. Stream Width:							
Channel	13	18.8	10	10.2	9.5	9.5	12.0
Water	6	7.8	4.3	10.2	8.5	8.5	8.5
12. Water Type %:							
SS	25	25	15	40	20	40	20
DS	30	25	20	30	15	20	5
SF	45	50	65	30	65	40	75
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	15	8	--	--	7	5	--
Boulder	3	2	5	2	20	25	25
Large Cobble	15	15	10	20	30	30	35
Small Cobble	40	35	30	35	20	20	20
Gravel	20	35	30	35	20	20	20
Sand	7	5	10	3	3	--	--
Muck	--	--	15	5	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	15/2	15/2	5/2	10/2	5/2	5/2	--
15. Rearing Area %	20	20	15	30	10	10	15
16. Pool Cover %	10	15	20	15	10	2	2
17. Riffle Cover %	1	15	20	5	5	10	15
18. Fish Observed	N	N	N	N	N	N	N
19. Sampling	Y	N	Y	Y	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Survey begins at perpendicular bend above tidal rapids.

Section 1-4: Extensive clearcut unit extends to left bank.

Section 3: Extensive, debris induced channel migration throughout. Undercut banks and clay deposits common. Several intact beaver dams redirect flow and provide impoundment rearing habitat.

Section 4: Streamflow bypasses intact debris/beaver dam inducing channel migration. 50m; The remainder of section demarcates the transition between Reach 1 and Reach 2, owing to a change in substrate and sideslope gradient.

22. Investigators Mickowski, Merrigan & Ericksen Date 5/18/83

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21

Reach Number	2	2	2	2	3	3	3
1. Section Number	8	9	10	11	12	13	14
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	146	160	148	152	143	156	159
4. Gradient	2.5	2.5	2.5	2.5	4.0	6.0	3.0
5. Water Quality	1	1	1	1	1	4	4
6. Bank Type	B	B	B	B	B	B	B
7. Bank Stability	1/1	1/1	1/1	1/1	1/1	2/1	2/1
8. Bank Vegetation	1-5	1-3,5	1-3,5	1-3,5	1-3,5	1,3-5	1,3-5
9. Debris Loading	3	7	5	9	15	15	20
10. Undercut Bank Length	25	--	10	--	--	--	5
11. Stream Width:							
Channel	11.3	11	12.7	10.8	10.2	10.5	10.5
Water	7.8	5.5	7.0	5.5	9.2	10.5	10.5
12. Water Type %: SS	20	20	20	35	30	15	15
DS	--	10	15	25	35	30	35
SF	80	65	65	40	30	50	40
DF	--	5	--	--	5	5	10
13. Substrate %:							
Bedrock	5	20	15	10	2	--	--
Boulder	20	20	20	15	8	15	5
Large Cobble	30	20	20	25	20	20	5
Small Cobble	20	20	20	25	30	30	40
Gravel	20	15	20	20	30	25	40
Sand	5	5	5	5	5	10	10
Muck	--	--	--	--	5	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	--	--	--	3/1	--	8/3	12/3
15. Rearing Area %	10	10	20	30	35	25	30
16. Pool Cover %	15	10	10	15	20	25	15
17. Riffle Cover %	15	15	10	15	5	2	2
18. Fish Observed	N	N	N	N	N	N	N
19. Sampling	N	N	N	N	N	Y	N
20. Potential Barriers	N	N	N	N	(Y)	(Y)	(Y)
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 9: Incidence of bedrock outcrop increases.

Section 10: 00m; Non-barrier bedrock cascade.

50m; Copious blowdown along right bank.

Reach 3, Section 12-27, is characterized by an incised V-notch, steep gradients, localized side slope failures, and a cobble/boulder substrate with bedrock outcrops. Rearing habitat, typically limited to peripheral boulder pools is enhanced by debris loading, however, spawning area remains minimal.

22. Investigators Mickowski, Merrigan & Ericksen Date 5/18/83

# LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21

Reach Number	3	3	3	3	3	3	3
1. Section Number	15	16	17	18	19	20	21
2. Section Length	100	100	100	400	300	100	200
3. Compass Bearing	169	154	147	213	198	154	162
4. Gradient	2	6	6	6	4	6	2
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	B	B	A	B	B	B	B
7. Bank Stability	2/1	2/1	2/1	2/1	2/1	1/3	2/1
8. Bank Vegetation	1,3-5	1-5	1-5	1-5	1-5	1,3-5	1-5
9. Debris Loading	5	9	15	10	7	1	4
10. Undercut Bank Length	--	--	--	--	--	--	--
11. Stream Width:							
Channel	11	10	9.4	6.2	11	7.2	5.5
Water	7.6	7.4	9.4	10	11	7.2	6.4
12. Water Type %: SS	15	5	5	3	10	5	--
DS	10	10	10	2	10	5	--
SF	65	60	70	60	50	60	--
DF	10	25	15	35	30	30	--
13. Substrate %:							
Bedrock	--	--	--	15	5	50	10
Boulder	20	20	20	30	30	25	25
Large Cobble	25	35	35	35	35	10	25
Small Cobble	35	25	25	10	20	10	25
Gravel	17	17	17	8	8	5	13
Sand	3	3	3	2	2	--	2
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	5/3	--	1/3	--	1/3	--	3/3
15. Rearing Area %	15	8	15	2	5	1	5
16. Pool Cover %	10	15	20	10	12	10	--
17. Riffle Cover %	10	10	5	10	10	10	--
18. Fish Observed (fry) SS	<6	--	--	<6	--	--	<6
19. Sampling	N	N	N	N	N	N	N
20. Potential Barriers	N	N	Y	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 18-21: Channel continues to be characterized by an incised V-notch, steep gradients, and a cobble/boulder substrate with bedrock outcrops. Paucity of rearing habitat is augmented by debris loading, however, spawning area remains minimal.

22. Investigators Ted Mickowski Date 5/25/83

## LEVEL TWO HABITAT SURVEY

Section 4: 70m; Buffer strip begins along left bank.

Section 5: Reach 2 begins amidst a stabilized cobble/boulder channel.  
Rearing habitat is primarily boulder induced; and spawning area  
is isolated, of marginal quality and somewhat compacted.

Section 6: 50m; Clearcut unit extends to left bank.

## LEVEL TWO HABITAT SURVEY

- Section 12-14: This segment of Reach 3 is characterized by step-like debris jams as the channel negotiates a steep notch. A clearcut unit bordering the left bank has resulted in copious right bank blowdown. Debris induced pooling has enhanced rearing habitat and stabilized movement of small cobble/gravel. However, several extensive jams appear to inhibit migration during periods of low flow. Side slope failure is common throughout.  
20m; A steep, 2 cfs tributary cuts a notch and enters the main stem via the right bank. No fish or habitat sighted amidst the slate bedrock/boulder substrate.  
40m; A 1.5 m "falls" over an imbedded cross stream log, represents a potential barrier to PS and CS.
- Section 13-14: Blowdown induced side slope failures common. Water color changed from clear to tan.

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21

Reach Number	3	3	3	3	3	3
1. Section Number	22	23	24	25	26	27
2. Section Length	200	100	200	200	200	100
3. Compass Bearing	152	164	164	184	155	161
4. Gradient	1.5	2.0	2.0	5.0	5.0	5.0
5. Water Quality	4	4	4	1	1	1
6. Bank Type	B	B	B	B	B	B
7. Bank Stability	2/1	2/1	2/1	2/2	2/2	2/2
8. Bank Vegetation	1-5	1,3-5	1-5	1-5	1-5	1-5
9. Debris Loading	5	2	15	8	9	6
10. Undercut Bank Length	15	25	15	--	--	--
11. Stream Width:						
Channel	9.6	9.6	9.0	8.1	9.9	9.0
Water	9.6	8.6	9.0	7.2	8.1	5.7
12. Water Type %:						
SS	10	10	10	10	10	10
DS	5	--	10	10	10	10
SF	80	80	40	75	75	75
DF	5	10	40	5	5	5
13. Substrate %:						
Bedrock	10	5	5	10	15	15
Boulder	10	5	10	25	25	30
Large Cobble	30	30	25	35	30	30
Small Cobble	30	30	35	15	15	15
Gravel	15	25	20	10	10	10
Sand	5	5	5	5	5	--
Muck	--	--	--	--	--	--
Other	--	--	--	--	--	--
14. ASA %/Quality	5/3	3/3	10/3	--	--	--
15. Rearing Area %	7	7	20	10	10	5
16. Pool Cover %	20	10	30	15	15	5
17. Riffle Cover %	10	10	10	10	10	5
18. Fish Observed (fry) SS	<6	<6	<6	--	6	--
19. Sampling	N	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N

Section 22-24: Channel remains incised, however the gradient moderates. The substrate is characterized by a cobble matrix but ASA and rearing remain isolated and minimal.

Section 22: Two, steep, 0.5 cfs tributaries enter the main stem from opposite banks. No fish or habitat were observed.

Section 24: Two, steep, less than 1 cfs tributaries enter channel from opposite banks providing no fisheries habitat.

22. Investigators Ted Mickowski Date 5/25/83



## LEVEL TWO HABITAT SURVEY

The first sub-sample, Section 25-27, was a continuation of the original survey concluded on May 25. Water temperature and quality were 4.5°C and 1 respectively.

Section 25: 12m; A steep, notched, 2.5 cfs tributary enters the main stem via the left bank. No fish or habitat were observed.

Section 25-27: Cobble/boulder V-notch continues. Numerous instream logs/stair step cascades. Localized upper slope failures and exposed soils common. No ASA observed. Rearing limited to peripheral boulder/debris pools. SS fry rearing limited.

Section 26: 35m; Steep, notched, less than 1 cfs drainage, enters channel via right bank.  
58m; Large mass wasting site along left bank.  
179m; Steep, notched, less than 1 cfs drainage enters channel via right bank.

Section 27: Bank instabilities continue. No fish or ASA observed. Marginal rearing throughout.

## LEVEL TWO HABITAT SURVEY

Due to the presence of SS fry, the distance from road access, and the homogenous nature of the channel, a helicopter and sub-sampling strategy were utilized to investigate upper Pine Creek.

### Survey Area "B"

The survey area encompasses the transition from a channelized flowing stream, to a beaver pond system. The flowing portion of the survey area is characterized by boulder/cobble substrate between steep banks. Fish habitat was poor though coho and trout fry were observed in moderate quantities. At Section 4: 50m; a beaver dam (2.0 x 25 m) was found to be in good repair and formed a pond/marsh area, 600 m in extent.

### Survey Area "C"

The survey area begins just above a large beaver system approximately 4 km up from the ITZ. This portion of stream contains quite sandy substrate initially as it flows through an old beaver system, but gradually acquires larger substrate moving upstream. ASA and rearing habitat are fair to good throughout the area. The stream flows through a V-notch at the terminus of the survey area. An aerial reconnaissance upstream revealed that the stream was soon dammed by beavers just above the survey.

### Survey Area "D"

This survey area is a tributary of Survey Area "C". This small stream provides good rearing habitat near the mouth but soon becomes steep and cascaded providing no significant fish habitat.

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21

Survey Area "B": About 4300m upstream from mouth.

Reach Number							
1. Section Number	1	2	3	4			
2. Section Length	100	100	100	50			
3. Compass Bearing	160	165	130	100			
4. Gradient	1.5	2.0	1.0	1.0			
5. Water Quality	1	1	1	1			
6. Bank Type	B	C/B	B	C/B			
7. Bank Stability	1(1)	1(1)	1(1)	1(1)			
8. Bank Vegetation	1, 3-5	1, 3-5	1, 3-5	1, 3-5			
9. Debris Loading	6	5	7	5			
10. Undercut Bank Length	40	20	80	30			
11. Stream Width:							
Channel	7.0	11.0	13.0	12.6			
Water	4.8	5.0	4.6	8.6			
12. Water Type %: SS	20	20	30	35			
DS	20	15	--	20			
SF	60	65	70	45			
DF	--	--	--	--			
13. Substrate %:							
Bedrock	--	--	--	--			
Boulder	5	15	15	5			
Large Cobble	30	20	30	25			
Small Cobble	30	40	45	45			
Gravel	30	20	10	25			
Sand	5	5	--	--			
Muck	--	--	--	--			
Other	--	--	--	--			
14. ASA %/Quality	5/2	5/2	--	10/2			
15. Rearing Area %	20	15	10	25			
16. Pool Cover %	5	5	15	10			
17. Riffle Cover %	10	10	5	5			
18. Fish Observed	SS	--	SS	SS			
			DV				
19. Sampling	N	N	N	Y			
20. Potential Barriers	Y	Y	Y	Y4			
21. Enhancement/Rehab	N	N	N	N			

Section 1: 0m; Steep banks. Boulder/cobble substrate. Poor fish habitat.

Section 2: 70m; Side slope tributary right side. No habitat. 8% gradient over cobble.

Section 4: 50m; Beaver dam (2.0 x 25m) with pond. Active cutting.

22. Investigators Gerry Merrigan Date 9/27/83

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Pine Creek 2. ADF&G Catalog No. 106-41-21

### Survey Areas

"C"

"D"

Reach Number	1	1	1	1	1		1
1. Section Number	1	2	3	4	5		1
2. Section Length	100	100	100	100	100		100
3. Compass Bearing	170	150	200	170	240		200
4. Gradient	1.0	1.5	2.0	3.0	2.5		5.0
5. Water Quality	3	3	3	3	3		1
6. Bank Type	A/B	B	A/B	B	B		B
7. Bank Stability	2/2	1/1	1/1	1/1	2/1		1/1
8. Bank Vegetation	1-5	1-5	1-5	1-4	1-4		1-5
9. Debris Loading	5	10	5	5	3		5
10. Undercut Bank Length	5	5	5	--	--		10
11. Stream Width:							
Channel	4.2	7.4	3.0	6.1	2.8		2.2
Water	4.2	4.7	2.8	6.1	2.8		2.0
12. Water Type %: SS	15	30	25	30	40		42
DS	5	10	5	5	--		3
SF	75	55	65	65	60		55
DF	5	5	5	--	--		--
13. Substrate %:							
Bedrock	--	--	5	5	10		--
Boulder	--	5	10	10	20		--
Large Cobble	10	15	15	15	30		5
Small Cobble	20	30	35	35	30		10
Gravel	30	35	25	25	10		30
Sand	40	15	10	10	--		55
Muck	--	--	--	--	--		--
Other	--	--	--	--	--		--
14. ASA %/Quality	5/1	5/2	3/2	5/2	2/2		3/2
15. Rearing Area %	20	20	10	10	10		10
16. Pool Cover %	3	10	5	5	5		3
17. Riffle Cover %	3	5	10	10	10		3
18. Fish Observed	SS	SS	SS	SS	SS		CT
	CT	CT	CT	CT	CT		
19. Sampling	N	N	N	N	N		N
20. Potential Barriers	N	N	N	N	N		N
21. Enhancement/Rehab	N	N	N	N	N		N

### Survey Area "C":

Section 1: Begin just above a large beaver system. Stream cuts a channel through old degenerated beaver pond. Coho fry present. A small tributary (Survey Area "D") enters the right bank at 55m.

Section 2: Increased gradient. Good riparian cover. ASA quality improves.

Section 3: Continue good riparian cover. Bedrock outcroppings present in substrate.

Section 4: Stream enters a V-notch.

22. Investigators Mickowski, Merrigan & Ericksen Date 9/27/83

## LEVEL TWO HABITAT SURVEY

Survey Area "C":

Section 5: Continue through V-notch. Significant shift in size of substrate to large cobble and boulders.

Survey Area "D":

Enters the right bank of Section 1 in Survey Area "C"; pH, 7.0; water temperature, 6.0°C; flow 1 cfs. Good habitat just above the confluence, but quickly degenerates moving upstream. Gradient becomes steep. Substrate consists largely of sand. The stream branches into two small tributaries containing no significant fish habitat.

# FISH SAMPLING FORM

Stream Name Pine Creek ADF&G Catalog No. 106-41-21 Date May 18 & 25, 1983

Identify Survey Area A Water Temp. 7.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0910	1600	--	--	Section 1
2	0930	1550	RB - 1	--	Section 3
3	0945	1540	SS - 1	--	Section 4
4	1200	1655	DV - 1	--	Section 13
5	1435	1610	--	--	Section 23
6	1115 9/27/83	1155	--	--	Survey Area "B" Section 4: 50m; In beaver pond. Water temperature 6°C.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL TWO HABITAT SURVEY

## Part I.

1. Survey Areas A (Main Stem only) 2. Section Length 100 m
3. Historical Fish Species no escapement data available

## Part II.

1. Stream Name California Bay #1 2. ADF&G Catalog No. n/a
3. Latitude 56°19'15" Longitude 133°15'00"
4. Agency Unit 05 5. Mgmt. Area 534.1K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 8-12-1981 Fl. Ln. 19 Roll 1379 Photo 82
8. Bay/Drainage California Bay 9. Access 2
10. Present Land Use none
11. Historical Land Use harvested unit about 20-25 years ago
12. Stream Origin 3, 5, 6 13. Estimated Flow 3.5 cfs 14. Flow Stage 3
15. Stream Temperature 9°C 16. pH 7.9 17. Beaver No
18. Temperature Sensitivity No
19. Barrier Yes, cascade/falls Section 2: 65 m 20. Weather 1

## Part III.

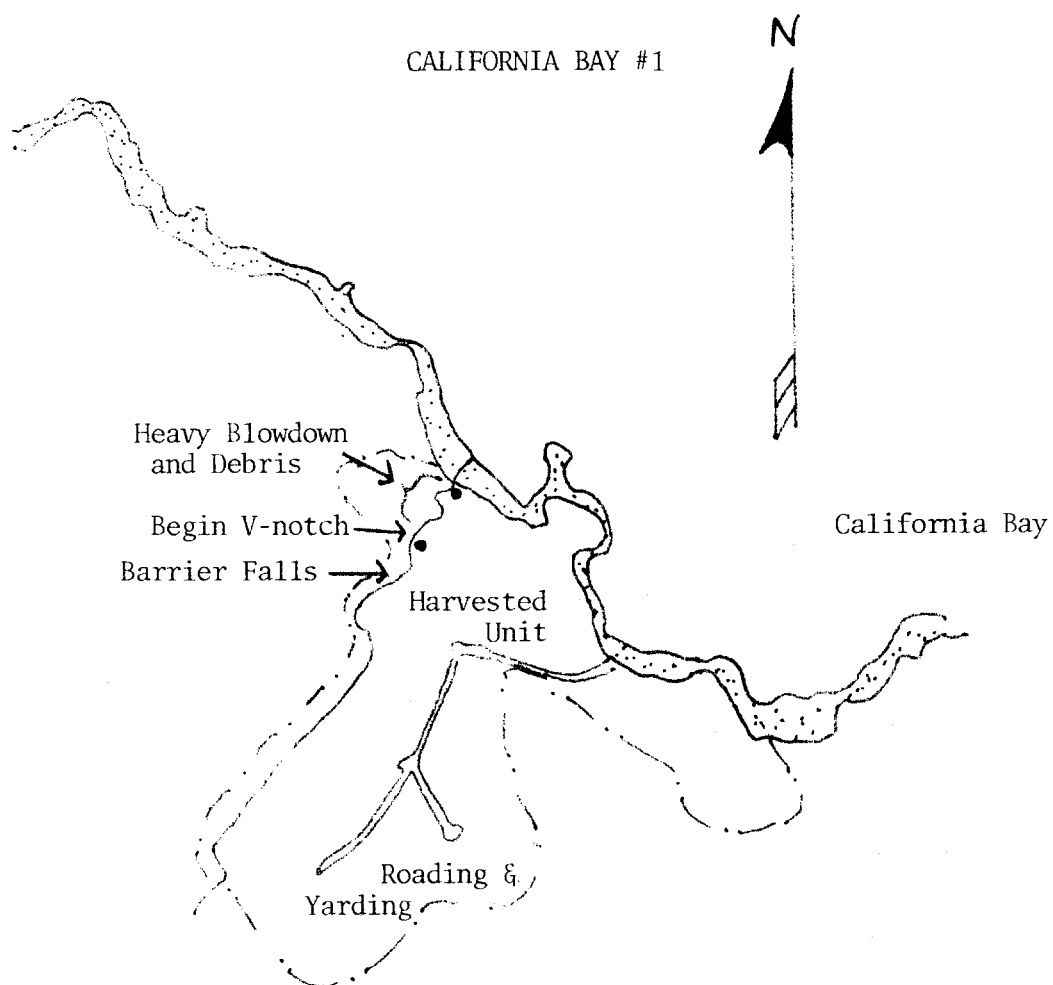
### 21. Intertidal

- A. Substrate: Fines 15 % Gravel/S. Cob. 50%  
L. Cob/Boulder/Bedrock 35 %
- B. Gradient 4%
- C. ASA % --
- D. Schooling No
- E. Shellfish None Observed
- F. Anchorage skiff anchorage in coves in bay/larger vessel anchorage in Red Bay

### 22. Comments

California Bay #1 is located in the NW corner of California Bay and flows on the border and through a 20-25 year old clearcut. The stream is small and steep (4% average gradient), with heavy blowdown and debris throughout. Comprised of cascades, riffles and falls over boulder/bedrock substrate, the stream has no ASA and little rearing potential. Survey was conducted at high water and no fish were observed or trapped. A barrier falls with a debris dam at the top is located 165 m from the ITZ. Reconnaissance above the falls indicates continued increasing gradient over bedrock with heavy blowdown. Consequently, this stream does not necessitate enhancement.

23. Investigators Gerry Merrigan 24. Date 5/19/83



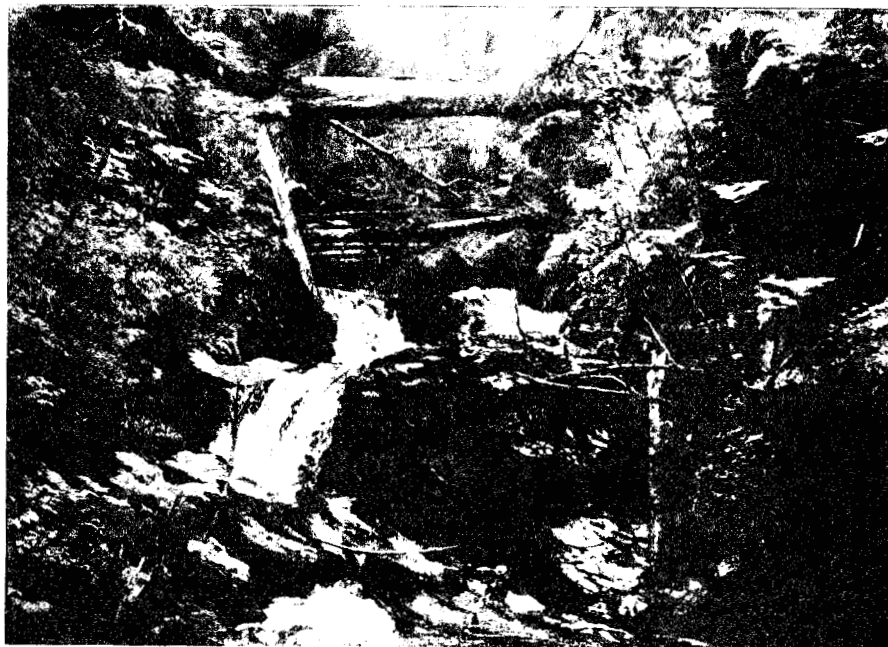
NORTH PRINCES OF WALES ISLAND



California Bay #1



1. Mouth of stream entering unit with full alder canopy. Cobble ITZ foreground.



2. Barrier cascade/falls with debris jam at top located in unit; Section 2: 65 m.

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name California Bay #1 2. ADF&G Catalog No. --

Reach Number							
1. Section Number	1	2					
2. Section Length	100	65					
3. Compass Bearing	141	176					
4. Gradient	3	5					
5. Water Quality	3	3					
6. Bank Type	B	B					
7. Bank Stability	2(1)	2(3)					
8. Bank Vegetation	1,2,3	1,2,3					
9. Debris Loading	40	30					
10. Undercut Bank Length	70	60					
11. Stream Width:							
Channel	2.5	4.9					
Water	2.0	4.8					
12. Water Type %: SS	--	--					
DS	--	--					
SF	90	90					
DF	10	10					
13. Substrate %:							
Bedrock	20	40					
Boulder	35	25					
Large Cobble	15	15					
Small Cobble	5	10					
Gravel	5	--					
Sand	--	--					
Muck	--	--					
Other	c 20	c 10					
14. ASA %/Quality	--	--					
15. Rearing Area %	10	15					
16. Pool Cover %	40	30					
17. Riffle Cover %	50	50					
18. Fish Observed	--	--					
19. Sampling	Y	N					
20. Potential Barriers	N	Y2					
21. Enhancement/Rehab							

Section 1: 0m; Enter harvested unit; completely alder canopy. Heavy amounts of debris, blowdown, and organic matter over bedrock/boulder substrate. Survey conducted at high flow level.

Section 2: 50m; Begin V-notch with cascades over bedrock. 65m; Barrier falls/cascades 8.0 m.

Reconnaissance above falls for 100 m shows continued cascades at 8% gradient over bedrock with no ASA or rearing habitat. Not recommended for enhancement.

22. Investigators Gerry Merrigan Date 5/19/83

## FISH SAMPLING FORM

Stream Name California Bay #1ADF&G Catalog No. n/a Date 5/19/83

Identify Survey Area A Water Temp. 9°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0940	1045	--		Stream flow was high at time of survey, close to being flooded. Juvenile fish were not observed in stream.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## LEVEL TWO HABITAT SURVEY

### Part I.

1. Survey Areas A 2. Section Length 100  
 3. Historical Fish Species no data available

### Part II.

1. Stream Name California Bay #2 2. ADF&G Catalog No. n/a  
 3. Latitude 56°19'30" E Longitude 133°13'35" N  
 4. Agency Unit 05 5. Mgmt. Area 534.1 6. USGS Map No. Petersburg B-4  
 7. Aerial Photo No. 20 610050 1279-166  
 8. Bay/Drainage California Bay 9. Access 2  
 10. Present Land Use none  
 11. Historical Land Use logging along beach near mouth  
 12. Stream Origin 4 13. Estimated Flow 10 cfs 14. Flow Stage 3  
 15. Stream Temperature 9.0 16. pH 7.0 17. Beaver yes  
 18. Temperature Sensitivity yes  
 19. Barrier none 20. Weather 1

### Part III.

#### 21. Intertidal

- A. Substrate: Fines 50 % Gravel/S. Cob. 40%  
 L. Cob/Boulder/Bedrock 10 %  
 B. Gradient 1.0 %  
 C. ASA % 10/fair  
 D. Schooling no  
 E. Shellfish no  
 F. Anchorage Red Bay

#### 22. Comments Reach Evaluation

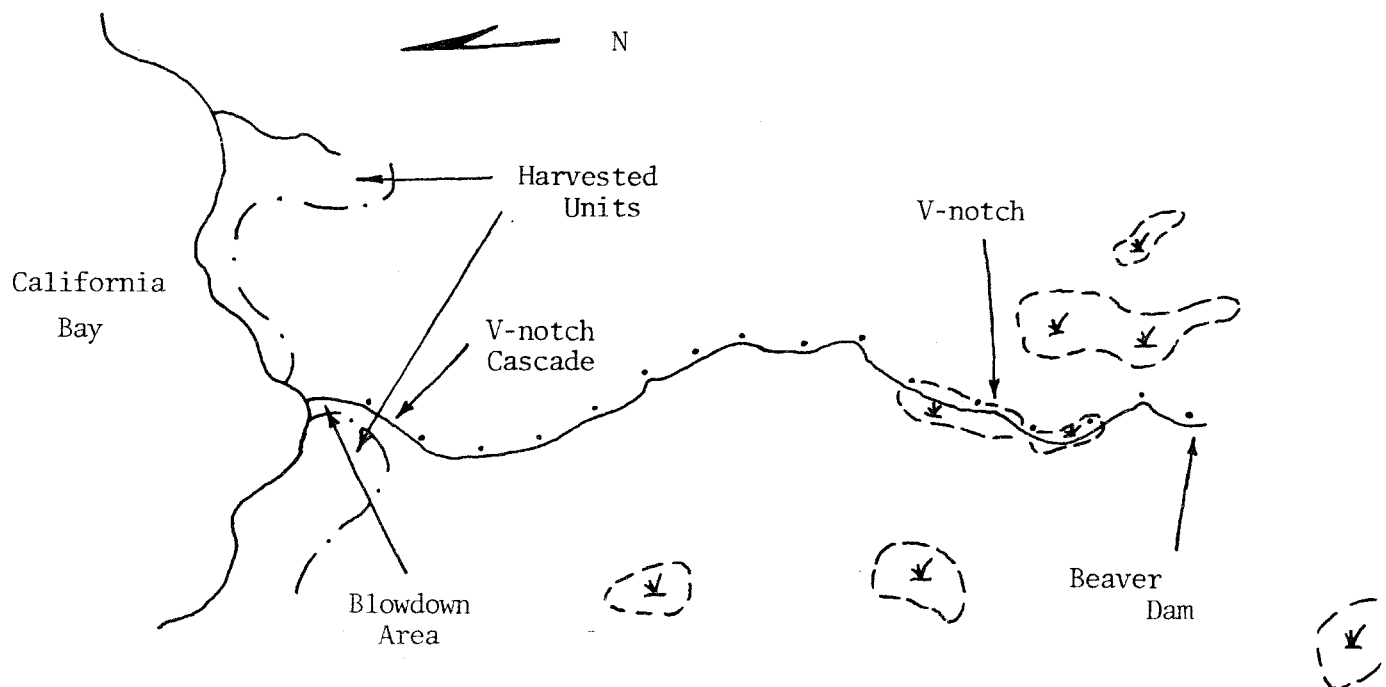
Reach #1 cuts a steep V-notch through bedrock. Several moderate cascades probably prevent anadromous fish migration although high water at the time of the survey made fish observation difficult.

Reach #2 had generally lower gradient and a greater percentage of gravel and small cobble. Rearing habitat quality diminishes moving up the reach due to lack of pools.

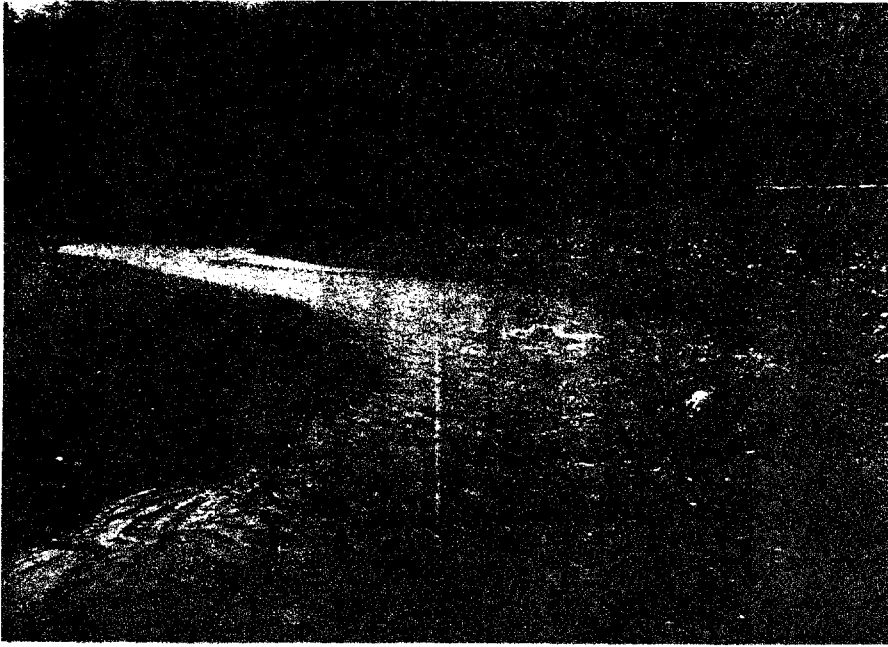
Reach #3 has steeper gradient and generally poor ASA. In the upper sections the stream becomes less steep as it cuts through a muskeg area. Overall, the stream is characterized by moderate/steep gradient, poor pool/riffle ratio (a large percentage of riffle), fair ASA, and poor rearing habitat. No juvenile salmon were caught or observed at the time of the survey.

23. Investigators Randy Ericksen 24. Date 5/19/83

CALIFORNIA BAY #2



California Bay #2



1. Intertidal zone looking at mouth of stream.



2. A steep V-notch area forms a cascading stream in Section 2.

California Bay #2



3. Section 6. A large riffle area creates good ASA.



4. Section 13. A steep, muskeg area produces poor fish habitat.

California Bay #2



5. 1.5 m high beaver dam at end of Section 16.



California Bay #2

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	100	4.5	--	--					
2	100	3.1	2	9					
3	100	2.7	5	13.5					
4	100	2.7	25	67.5					
5	100	3.4	35	119					
6	100	3.5	20	70					
7	100	2.7	30	81					
8	100	2.3	15	34.5					
9	100	2.8	10	28					
10	100	1.8	--	--					
11	100	3.1	--	--					
12	100	4.2	10	42					
13	100	3.8	4	15.2					
14	100	1.8	2	3.6					
15	100	1.2	1	1.2					
16	100	3.1	--	--					
Total				484.5m <sup>2</sup>					

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name California Bay #2 2. ADF&G Catalog No. n/a

Reach Number	1	1	2	2	2	2	2
1. Section Number	1	2	3	4	5	6	7
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	200	--	140	190	205	160	155
4. Gradient	12	11	4	3	3	4	3
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	B	B	D	D	D	B	B
7. Bank Stability	1/1	1/2	3/3	3/3	3/3	1/1	1/1
8. Bank Vegetation	1,3	1,3	1,3	1,3	1,3	1,3	1,3
9. Debris Loading	20	5	10	10	15	10	5
10. Undercut Bank Length	--	10	30	40	20	20	10
11. Stream Width:							
Channel	4.5	3.1	3.1	2.7	4.4	3.5	2.7
Water	4.5	3.1	2.7	2.7	3.4	3.5	2.7
12. Water Type %: SS	10	5	30	35	15	15	15
DS	10	5	10	5	5	--	5
SF	80	80	50	60	80	80	80
DF	--	10	10	--	--	5	--
13. Substrate %:							
Bedrock	30	35	10	--	--	--	5
Boulder	30	20	20	5	2	10	15
Large Cobble	20	30	20	10	5	10	5
Small Cobble	10	10	30	60	70	60	60
Gravel	10	5	20	25	20	15	15
Sand	--	--	--	--	3	5	--
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	--	2/2	5/2	25/2	35/2	20/2	30/2
15. Rearing Area %	30	25	20	30	15	10	5
16. Pool Cover %	30	5	15	10	20	15	30
17. Riffle Cover %	60	10	10	25	10	10	5
18. Fish Observed							
19. Sampling	Y	Y	N	N	N	N	N
20. Potential Barriers	Y	Y	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 1: The survey begins above the ITZ at the first alder patch within treeline. Beach logging near the mouth of the creek has caused some blowdown. A substantial debris jam just above the ITZ may inhibit fish passage. The stream soon becomes V-notched and cascaded.

Section 2: Continue V-notch cascade. Large cascade plunges may be a barrier.

22. Investigators Randy Ericksen Date 5/19/83

## LEVEL TWO HABITAT SURVEY

### California Bay #2

- Section 3: The gradient abruptly drops to about 5%. Good pool/riffle ratio and undercut banks provide excellent rearing habitat. Blue clay present.
- Section 4: Continue gentle gradient. Blue clay deposits along right bank. Substrate size decreases forming excellent ASA.
- Section 5: Same as above.
- Section 6: Banks become more sloped. The occurrence of undercut banks diminish.
- Section 7: Debris loading diminishes. Pools are replaced by riffle. Rearing habitat becomes marginal.

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name California Bay #2 2. ADF&G Catalog No. n/a

Reach Number	2	2	3	3	3	3	3
1. Section Number	8	9	10	11	12	13	14
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	220	210	210	260	245	260	250
4. Gradient	3	3	9	10	7	5	4
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	B	B	B	C	B	C	C
7. Bank Stability	1/1	1/1	1/1	1/1	1/1	1/1	1/1
8. Bank Vegetation	1,3	1,5	1,3	1,5	1,3	1,5	1,5
9. Debris Loading	5	5	5	5	2	5	2
10. Undercut Bank Length	5	--	5	20	--	--	5
11. Stream Width:							
Channel	2.3	2.8	1.8	3.1	4.2	3.8	1.8
Water	2.3	2.8	1.8	3.1	4.2	3.8	1.8
12. Water Type %: SS	20	25	10	10	--	10	20
DS	10	10	--	--	--	5	10
SF	60	60	90	90	100	80	60
DF	10	5	--	--	--	5	10
13. Substrate %:							
Bedrock	5	--	10	10	--	5	15
Boulder	20	10	10	25	10	20	20
Large Cobble	10	20	40	35	40	30	35
Small Cobble	50	50	20	30	30	35	25
Gravel	10	15	20	10	20	10	5
Sand	5	5	--	--	--	--	--
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	15/2	10/2	--	--	10/2	4/2	2/2
15. Rearing Area %	10	10	2	5	--	10	5
16. Pool Cover %	20	10	--	5	--	2	10
17. Riffle Cover %	3	5	2	--	10	4	2
18. Fish Observed							
19. Sampling	N	N	Y	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 8: A small increase in larger substrate decreases ASA.

Section 9: Same as above.

Section 10: An abrupt increase in gradient occurs as the stream passes through a moderate V-notch. A small 2 m falls may inhibit fish passage. Poor fish habitat. Well defined channel.

Section 11: Continue steep gradient. Muskeg borders upper banks. Bedrock and boulders dominate substrate composition.

22. Investigators Randy Ericksen Date 5/19/83

LEVEL TWO HABITAT SURVEY

California Bay #2

Section 12: Several large gravel patches create good ASA.

Section 13: Cedar and sedges form the majority of bank vegetation. Banks remain steep.

Section 14: Same as above.

# LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name California Bay #2 2. ADF&G Catalog No. n/a

Reach Number	3	3					
1. Section Number	15	16					
2. Section Length	100	40					
3. Compass Bearing	155	--					
4. Gradient	5	4					
5. Water Quality	4	4					
6. Bank Type	C	C					
7. Bank Stability	1/1	1/1					
8. Bank Vegetation	1,5	1,5					
9. Debris Loading	2	2					
10. Undercut Bank Length	--	20					
11. Stream Width:							
Channel	1.2	3.1					
Water	1.2	3.1					
12. Water Type %: SS	10	10					
DS	5	5					
SF	80	85					
DF	5	--					
13. Substrate %:							
Bedrock	15	5					
Boulder	30	10					
Large Cobble	30	30					
Small Cobble	20	35					
Gravel	5	20					
Sand	--	--					
Muck	--	--					
Other	--	--					
14. ASA %/Quality	1/2	--					
15. Rearing Area %	15	15					
16. Pool Cover %	2	2					
17. Riffle Cover %	1	2					
18. Fish Observed							
19. Sampling	N	N					
20. Potential Barriers	N	N					
21. Enhancement/Rehab	N	N					

Section 15: Substrate consists mostly of bedrock and boulders. Fish habitat marginal.

Section 16: Survey ends at 1.5 m high beaver pond. A reconnaissance above reveals a long, narrow pond fed by numerous muskeg seeps. No ASA above. Survey terminated.

22. Investigators Randy Ericksen Date 5/19/83

## FISH SAMPLING FORM

Stream Name California Bay #2ADF&G Catalog No. n/a Date 5/19/83

Identify Survey Area "A"      Water Temp. 9.0°C      Bait Used Live: worst

Trap	Time In	Time Out	Species	Length	Comments
1	1000	1435	3 DV	--	Set above debris dam.
2	1025	1415	1 CT	--	Set above cascade area in plunge pool. Fish was approximately 130 mm in length.
3	1140	1350	--	--	No fish caught or seen above Section 3. However, water was high and very dark so observations were limited.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL TWO HABITAT SURVEY

## Part I.

1. Survey Areas A (Main Stem only) 2. Section Length 100 m
3. Historical Fish Species no escapement data available

## Part II.

1. Stream Name California Bay #3 2. ADF&G Catalog No. third stream in California Bay from west point
3. Latitude 56°19'35" Longitude 133°13'20"
4. Agency Unit 05 5. Mgmt. Area 534.1K 6. USGS Map No.
7. Aerial Photo No. 1981 Photos Fl. Ln 20 Roll 1279 Photo 167
8. Bay/Drainage California Bay, N. Point 9. Access 2
10. Present Land Use none
11. Historical Land Use harvest approximately 20 years ago
12. Stream Origin 3, 4, 5 13. Estimated Flow 5.0 cfs 14. Flow Stage 3
15. Stream Temperature 8°C 16. pH 7.5 17. Beaver Yes
18. Temperature Sensitivity no
19. Barrier beaver dams 20. Weather 1

## Part III.

### 21. Intertidal

- A. Substrate: Fines 10 % Gravel/S. Cob. 40 %  
L. Cob/Boulder/Bedrock 50 %
- B. Gradient 2.5 %
- C. ASA % 0
- D. Schooling No
- E. Shellfish No
- F. Anchorage skiff anchorage in California Bay,  
larger vessel in Red Bay

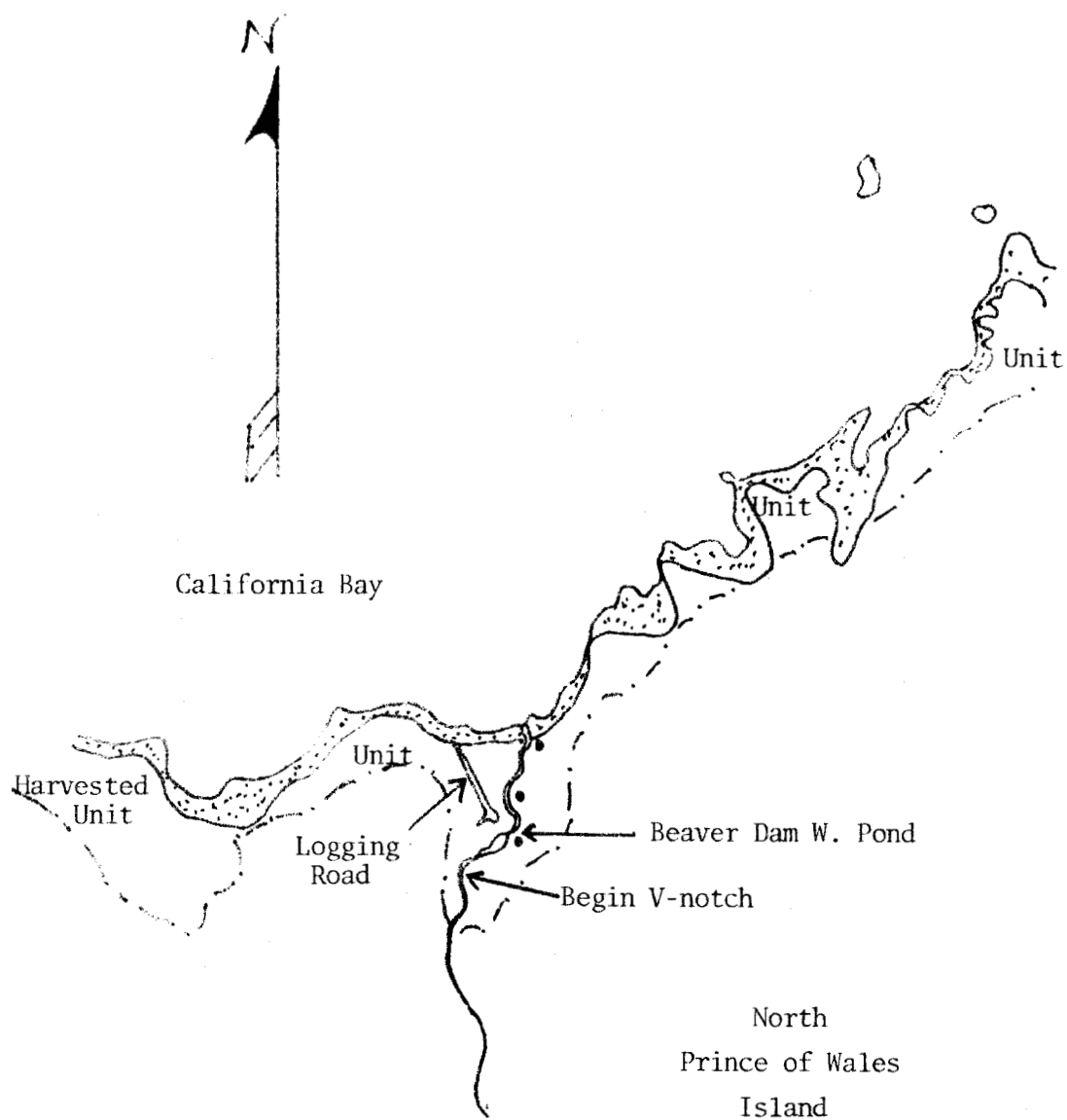
### 22. Comments

The stream is a beaver impounded system, flowing through a harvested unit. Beginning with a steep gradient, the stream flows over bedrock/boulder substrate until a series of beaver dams and ponds influence the stream for 200 m. Flow resumes in a bedrock V-notch with numerous debris dams and increasing gradient. No spawning area observed for entire system. Stream surveyed at high flow level with dark tan water quality; consequently, no fry were observed in this system of rearing habitat only.

23. Investigators Gerry Merrigan 24. Date 5/25/83



CALIFORNIA BAY #3



California Bay #3



1. ITZ with boulder/cobble substrate and no ASA.



2. Mouth of stream with tidal falls. Harvested unit on both banks.

California Bay #3



3. Beaver dam at Section 2: 60 m.



4. Debris jammed V-notch located within unit above beaver pond.

# LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name California Bay #3 2. ADF&G Catalog No. third stream in California Bay numbering from west point of bay

Reach Number	1						
1. Section Number	1	2					
2. Section Length	100	60					
3. Compass Bearing	180	180					
4. Gradient	3	3					
5. Water Quality	4	4					
6. Bank Type	B	B					
7. Bank Stability	1(2)	1(2)					
8. Bank Vegetation	1,3,5	1-3,5					
9. Debris Loading	3	8					
10. Undercut Bank Length	--	--					
11. Stream Width:							
Channel	5.1	6.7					
Water	5.1	5.7					
12. Water Type %: SS	10	20					
DS	5	15					
SF	85	60					
DF	--	5					
13. Substrate %:							
Bedrock	25	25					
Boulder	30	40					
Large Cobble	30	20					
Small Cobble	10	10					
Gravel	5	5					
Sand	--	--					
Muck	--	--					
Other	--	--					
14. ASA %/Quality	--	--					
15. Rearing Area %	5	15					
16. Pool Cover %	10	25					
17. Riffle Cover %	10	5					
18. Fish Observed	--	--					
19. Sampling	Y	Y					
20. Potential Barriers	N	Y					
21. Enhancement/Rehab	N	N					

Section 1: 0m; Stream begins with 1.25 m debris falls above tidal rapids with harvested unit both sides. Stream flow, at steep gradient, is over boulder/bedrock substrate within stable banks. Water quality is dark tan, with poor visibility for observing fry.  
 Section 2: 40m; Inactive, yet stable, beaver dam on left bank.  
 60m; Beaver dam on main stem; stable and inactive.

22. Investigators Gerry Merrigan Date 5/25/83

## LEVEL TWO HABITAT SURVEY

### California Bay #3

Reconnaissance Above Dam: At 40 m upstream, another beaver dam (2.0 m high) is located, forming a pond for 160 m. Stream resumes flow at 4% gradient within a bedrock V-notch. Stream course is still within unit at this point, and consequently many debris jams present. No salmon fry were observed above Section 2: 60 m.

## FISH SAMPLING FORM

Stream Name California Bay #3 ADF&G Catalog No. n/a Date 5/25/83

Identify Survey Area Main Stem Water Temp. 8°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1045	1220	SS - 1		Section 1: 0m; Large second season salmon.
2	1105	1212	DV - 2		Section 2: 65m; Above beaver dam.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## LEVEL TWO HABITAT SURVEY

### Part I.

1. Survey Areas A 2. Section Length 100 m  
 3. Historical Fish Species no data available

### Part II.

1. Stream Name California Bay #4 2. ADF&G Catalog No. n/a  
 3. Latitude 56°19'45"N Longitude 133°12'35"E  
 4. Agency Unit 05 5. Mgmt. Area 534.1 6. USGS Map No. Petersburg B-4  
 7. Aerial Photo No. 21 610050 679-159  
 8. Bay/Drainage California Bay 9. Access 2  
 10. Present Land Use none  
 11. Historical Land Use logging along beach near mouth  
 12. Stream Origin 1, 4 13. Estimated Flow 8 cfs 14. Flow Stage 3  
 15. Stream Temperature 8.0°C 16. pH 6.5 17. Beaver no  
 18. Temperature Sensitivity no  
 19. Barrier cascading falls at end of survey 20. Weather 6, 1

### Part III.

#### 21. Intertidal

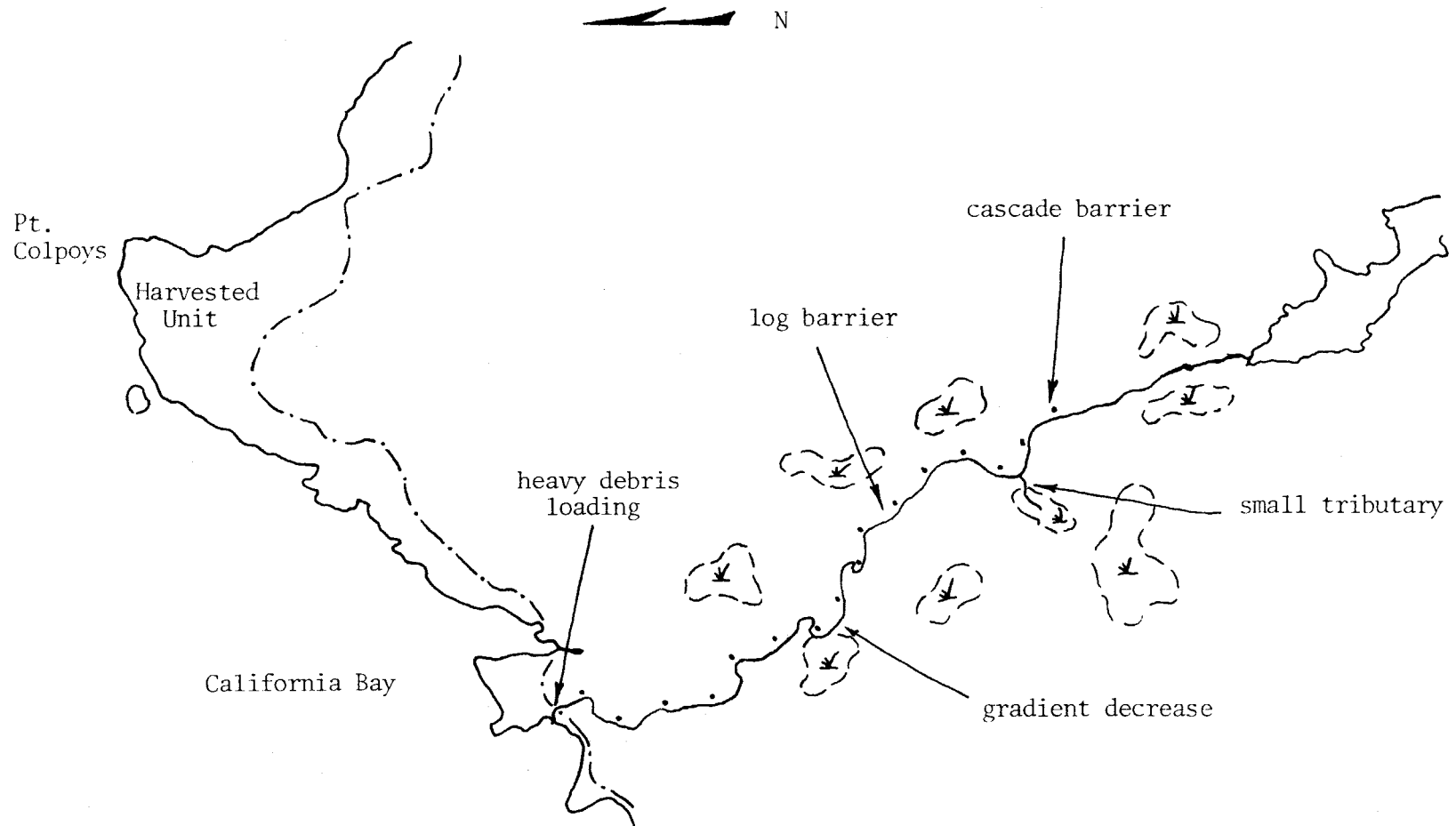
- A. Substrate: Fines 10% Gravel/S. Cob. 65%  
 L. Cob/Boulder/Bedrock 25%  
 B. Gradient 3.5 %  
 C. ASA % 30%/fair  
 D. Schooling no  
 E. Shellfish no  
 F. Anchorage Red Bay

#### 22. Comments Stream Evaluation

This stream was surveyed during high water making fish and substrate observations difficult. No juvenile salmon were seen or captured. Reach 1 was characteristically steep, with predominantly shallow, fast water. Debris loading was minimal, creating few pools. ASA was low because of the influx of sand and large substrate interspersed between patches of small cobble and gravel. Fish habitat improves slightly in Reach 2. Gradient decreases creating better rearing habitat. Overall the stream has poor fish habitat. Bedrock and boulders were common throughout the stream.

23. Investigators Randy Ericksen 24. Date 5/25/83

CALIFORNIA BAY #4

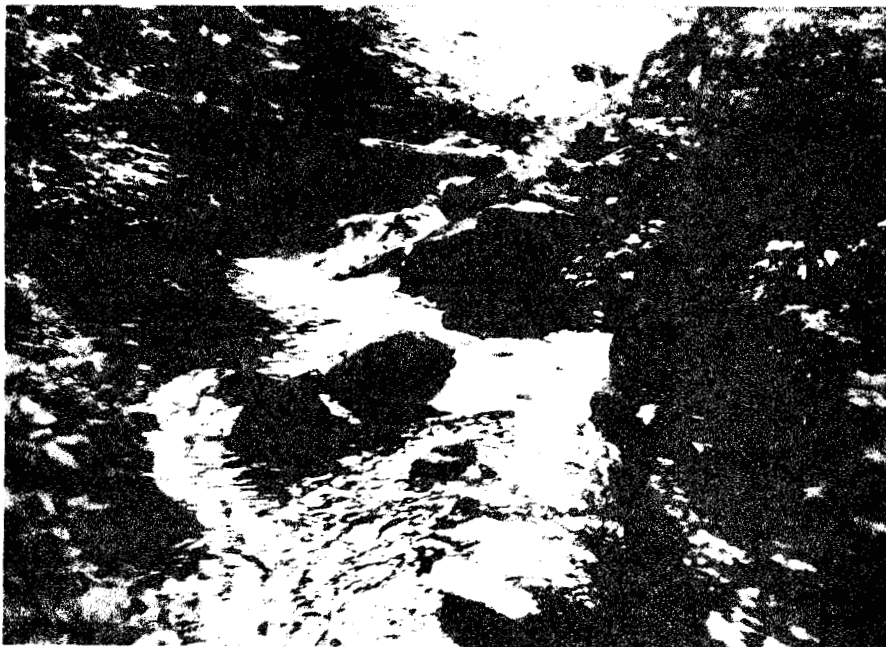




California Bay #4

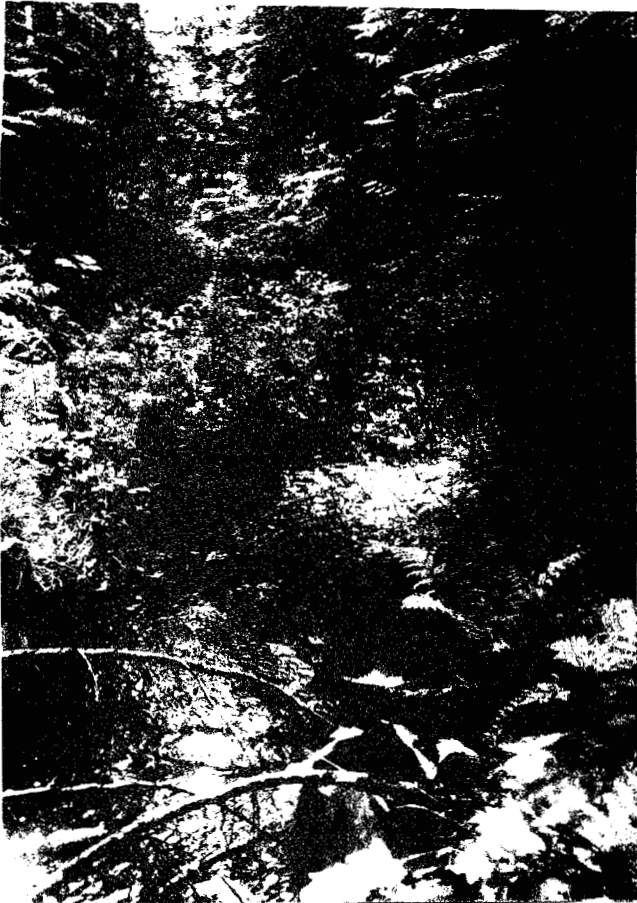


1. Intertidal zone looking at mouth.



2. Large cobble and boulder substrate in Section 5.

California Bay #4



3. Lower gradient along Section 13.



4. V-notch cascade at end of  
Section 16.

California Bay #4

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	100	1.9	2	3.8					
2	100	2.0	--	0					
3	100	2.1	2	4.2					
4	100	2.2	10	22					
5	100	2.1	5	10.5					
6	100	2.7	2	5.4					
7	100	1.9	10	19					
8	100	2.7	2	5.4					
9	100	1.9	10	19					
10	100	1.5	15	22.5					
11	100	1.2	--	0					
12	100	1.6	2	3.2					
13	100	1.0	5	5					
14	100	1.3	5	6.5					
15	100	1.5	--	0					
16	85	0.6	--	0					
Total				126.5m <sup>2</sup>					

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name California Bay #4 2. ADF&G Catalog No. n/a

Reach Number	1	1	1	1	1	1	2
1. Section Number	1	2	3	4	5	6	7
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	145	145	265	200	140	155	135
4. Gradient	3.0	5.0	6.0	4.5	5.0	6.0	3.0
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	B	B	C	C	C	C	C
7. Bank Stability	1/1	1/1	1/1	1/1	1/1	1/1	1/1
8. Bank Vegetation	1,3,4	1-3	1,3,4	1,3,4	1,3,4	1,3,4	1,3,4
9. Debris Loading	10	3	3	3	2	5	2
10. Undercut Bank Length	15	120	115	90	70	75	10
11. Stream Width:							
Channel	2.1	2.0	2.1	2.2	2.1	2.7	1.9
Water	1.9	2.0	2.1	2.2	2.1	2.7	1.9
12. Water Type %: SS	10	10	15	20	15	10	20
DS	5	--	--	5	--	5	5
SF	85	90	85	75	85	85	75
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	5	--	10	5	5	5	10
Boulder	5	5	5	5	5	--	10
Large Cobble	10	15	10	10	10	5	5
Small Cobble	40	35	30	30	35	40	30
Gravel	30	35	40	40	40	45	40
Sand	10	10	5	10	5	5	5
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	2/3	--	2/2	10/2	5/2	2/2	10/2
15. Rearing Area %	5	3	5	10	2	3	15
16. Pool Cover %	5	5	5	3	--	--	--
17. Riffle Cover %	5	10	5	5	5	3	2
18. Fish Observed	DV		CT				
19. Sampling	Y	N	Y	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 1: Logged both banks first 30 m. Debris loading heavy. Poor ASA.

Section 2: Slight increase in gradient. Undercut banks prevalent.

Section 3: Canopy composition consists mainly of hemlock and cedar. Steep gradient.

Section 4: Muskeg visible on upper banks. ASA quality improves.

Section 5: Muskeg-like banks. Poor/fair fish habitat.

Section 6: Same as above.

Section 7: Moderate/low gradient. Large percentage small cobble/gravel. Good ASA.

22. Investigators Randy Ericksen Date 5/25/83

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name California Bay #4 2. ADF&G Catalog No. n/a

Reach Number	2	2	2	2	2	2	2
1. Section Number	8	9	10	11	12	13	14
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	125	50	140	135	155	160	150
4. Gradient	2.5	3.0	4.5	3.5	5.0	2.5	3.5
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	C	C	C	B	B	B	B
7. Bank Stability	1/1	1/1	1/1	1/1	1/1	1/1	1/1
8. Bank Vegetation	1,3,4	1,3,4	1,3,4	1,4	1,4	1,4	1,4
9. Debris Loading	5	10	5	10	10	2	2
10. Undercut Bank Length	50	30	5	5	50	10	30
11. Stream Width:							
Channel	2.7	1.9	1.5	1.6	1.6	1.9	1.9
Water	2.7	1.9	1.5	1.2	1.6	1.0	1.3
12. Water Type %: SS	10	20	15	20	35	20	25
DS	5	5	10	--	--	5	5
SF	85	75	75	80	65	75	70
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	5	10	--	5	5	--	--
Boulder	--	5	5	--	5	5	5
Large Cobble	5	5	5	20	10	10	15
Small Cobble	40	35	40	35	35	45	25
Gravel	45	40	40	20	40	35	50
Sand	5	5	10	10	--	5	5
Muck	--	--	--	10	5	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	2/2	10/2	15/2	--	2/2	5/2	5/2
15. Rearing Area %	3	15	15	10	5	5	5
16. Pool Cover %	--	--	10	20	10	5	2
17. Riffle Cover %	3	2	3	2	2	10	15
18. Fish Observed							
19. Sampling	N	N	N	Y	N	N	N
20. Potential Barriers	N	N	N	3	N	N	N
21. Enhancement/Rehab	N	N	N	Y	N	N	N

Section 8: Continue low gradient along edge of muskeg.

Section 9: Continue low gradient along edge of muskeg. Good ASA and rearing habitat.

Section 10: Same as above. Underground flow for 10 m.

Section 11: A huge tree has fallen across the stream course and decayed. A 20 cm gap below allows water to flow underneath but may inhibit fish migration. Canopy composition consists of spruce and hemlock.

Section 12: Slight increase in gradient.

22. Investigators Randy Ericksen Date 5/25/83

LEVEL TWO HABITAT SURVEY

California Bay #4

Section 13: Low gradient. Good riparian vegetation.

Section 14: Same as above.

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name California Bay #4 2. ADF&G Catalog No. n/a

Reach Number	2	2					
1. Section Number	15	16					
2. Section Length	100	85					
3. Compass Bearing	210	160					
4. Gradient	4.0	11.0					
5. Water Quality	4	4					
6. Bank Type	C	B					
7. Bank Stability	1/1	1/1					
8. Bank Vegetation	1,4	1,4					
9. Debris Loading	15	5					
10. Undercut Bank Length	20	--					
11. Stream Width:							
Channel	1.9	2.5					
Water	1.5	0.6					
12. Water Type %:							
SS	30	5					
DS	5	--					
SF	65	95					
DF	--	--					
13. Substrate %:							
Bedrock	--	15					
Boulder	10	10					
Large Cobble	20	20					
Small Cobble	20	25					
Gravel	40	25					
Sand	5	5					
Muck	5	--					
Other	--	--					
14. ASA %/Quality	--	--					
15. Rearing Area %	10	2					
16. Pool Cover %	20	5					
17. Riffle Cover %	20	5					
18. Fish Observed							
19. Sampling	N	N					
20. Potential Barriers	N	1					
21. Enhancement/Rehab	N	N					

Section 15: Muskeg visible on left bank. A 1.5 cfs tributary enters the right bank. This tributary provides about 40 m of rearing habitat (sharply undercut banks, sand substrate). This tributary originates from a muskeg 50 m from the main stem.

Section 16: Steep V-notch. Survey ends at a steep cascading falls.

22. Investigators Randy Ericksen Date 5/25/83

## FISH SAMPLING FORM

Stream Name California Bay #4 ADF&G Catalog No. n/a Date 5/25/83

Identify Survey Area "A" Water Temp. 8.0°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0930	1400	1 DV		Section #1
2	1000	1345	1 CT		Section #3
3	1115	1130	--		Section #11

This form is used to record fish caught during Level Three, Four, or Five Surveys.



# LEVEL TWO HABITAT SURVEY

## Part I.

1. Survey Areas A (Main Stem only) 2. Section Length n/a
3. Historical Fish species no escapement data available

## Part II.

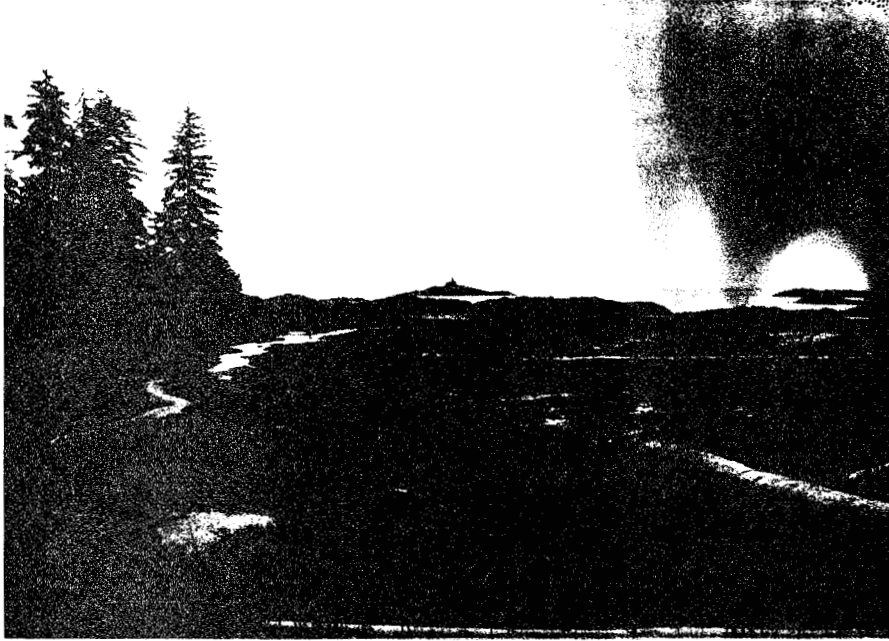
1. Stream Name California Bay #5 2. ADF&G Catalog No. n/a
3. Latitude 56°19'10" Longitude 133°11'45"
4. Agency Unit 05 5. Mgmt. Area 534.1K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 1981 Photos Fl. Ln. 20 Photo 167
8. Bay/Drainage California Bay 9. Access 2
10. Present Land Use none
11. Historical Land Use none
12. Stream Origin 4, 5 13. Estimated Flow 2 cfs 14. Flow Stage 3
15. Stream Temperature 8.5°C 16. pH 5.0 17. Beaver No
18. Temperature Sensitivity no
19. Barrier no 20. Weather 1

## Part III.

21. Intertidal
  - A. Substrate: Fines 30 % Gravel/S. Cob. 40 %  
L. Cob/Boulder/Bedrock 30 %
  - B. Gradient 2 %
  - C. ASA poor
  - D. Schooling in bay only
  - E. Shellfish moderate
  - F. Anchorage skiff anchorage in coves in California Bay/larger vessel use in Red Bay
22. Comments:  
This system is comprised of a small stream which empties into a 20 m x 50 m intertidal rearing pond that is 0.5 m in depth. The stream is a muskeg drain only 0.25 m wide with a rapidly increasing gradient (from 3% to 10% in 50 m) and contains no ASA, hence the system is primarily of intertidal rearing significance only. Moderate amounts of silver salmon fry were observed in the pool. Tidal rapids drain the pool with a lengthy tide flat (275 m) at low tide. Heavy black bear sign was noted.

23. Investigators Gerry Merrigan 24. Date 5/19/83

California Bay #5



1. Downstream view of ITZ extending toward California Bay.



2. Intertidal rearing pond with outlet in foreground.

LEVEL TWO HABITAT SURVEY

Part I.

1. Survey Areas A (Main Stem only) 2. Section Length n/a  
3. Historical Fish Species no escapement data available

Part II.

1. Stream Name California Bay #6 2. ADF&G Catalog No. n/a  
3. Latitude 56°20'10" Longitude 133°12'45"  
4. Agency Unit 05 5. Mgmt. Area 534.1K 6. USGS Map No. Petersburg B-4  
7. Aerial Photo No. 8/11/1981 Fl. Ln. 20 Photo 168  
8. Bay/Drainage California Bay 9. Access 2  
10. Present Land Use none  
11. Historical Land Use harvested unit about 20-25 years ago  
12. Stream Origin 3, 4, 5, 6 13. Estimated Flow 3 cfs 14. Flow Stage 3  
15. Stream Temperature 10°C 16. pH 6.0 17. Beaver yes  
18. Temperature Sensitivity no  
19. Barrier no 20. Weather 1

Part III.

21. Intertidal

- A. Substrate: Fines 20 % Gravel/S. Cob. 40 %  
L. Cob/Boulder/Bedrock 40 %  
B. Gradient 3 %  
C. ASA % poor  
D. Schooling in bay only  
E. Shellfish none observed  
F. Anchorage skiff anchorage in bay/ larger vessel use in Red Bay

22. Comments

This stream consists chiefly of a beaver dam system within a 20-25 year old clearcut. The first beaver dam is located immediately above the ITZ with successive dams located at 5 m and 30 m respectively above the ITZ, forming a pond 40 m across and extending about 300 m into the old unit. Beaver dams are in good repair and display active cutting. Moderate amount of coho fry were observed in pond. This system contains rearing habitat only.

23. Investigators Gerry Merrigan 24. Date 5/19/83

California Bay #6



1. Mouth of stream with successive beaver dams forming pond extending into harvested unit.

# LEVEL TWO HABITAT SURVEY

## Part I.

1. Survey Areas A
2. Section Length 100 m
3. Historical Fish Species no escapement data available

## Part II.

1. Stream Name Bay Creek
2. ADF&G Catalog No. 106-41-19
3. Latitude 56°19'04"
- Longitude 133°10'10"
4. Agency Unit 05
5. Mgmt. Area 534.1 K
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 79-21-679-160
8. Bay/Drainage Clarence Strait
9. Access 2
10. Present Land Use none
11. Historical Land Use logging and log storage
12. Stream Origin 3-6
13. Estimated Flow 3.0 cfs
14. Flow Stage 3
15. Stream Temperature 10
16. pH 6.0
17. Beaver yes
18. Temperature Sensitivity yes
19. Barrier no
20. Weather 3

## Part III.

### 21. Intertidal

- A. Substrate: Fines 20 % Gravel/S. Cob. 78 %  
L. Cob/Boulder/Bedrock 2 %
- B. Gradient 1.5 %
- C. ASA % 35/Fair
- D. Schooling yes, in bay
- E. Shellfish moderate in ITZ
- F. Anchorage vessel in Salmon Bay; Skiff off mouth

### 22. Comments

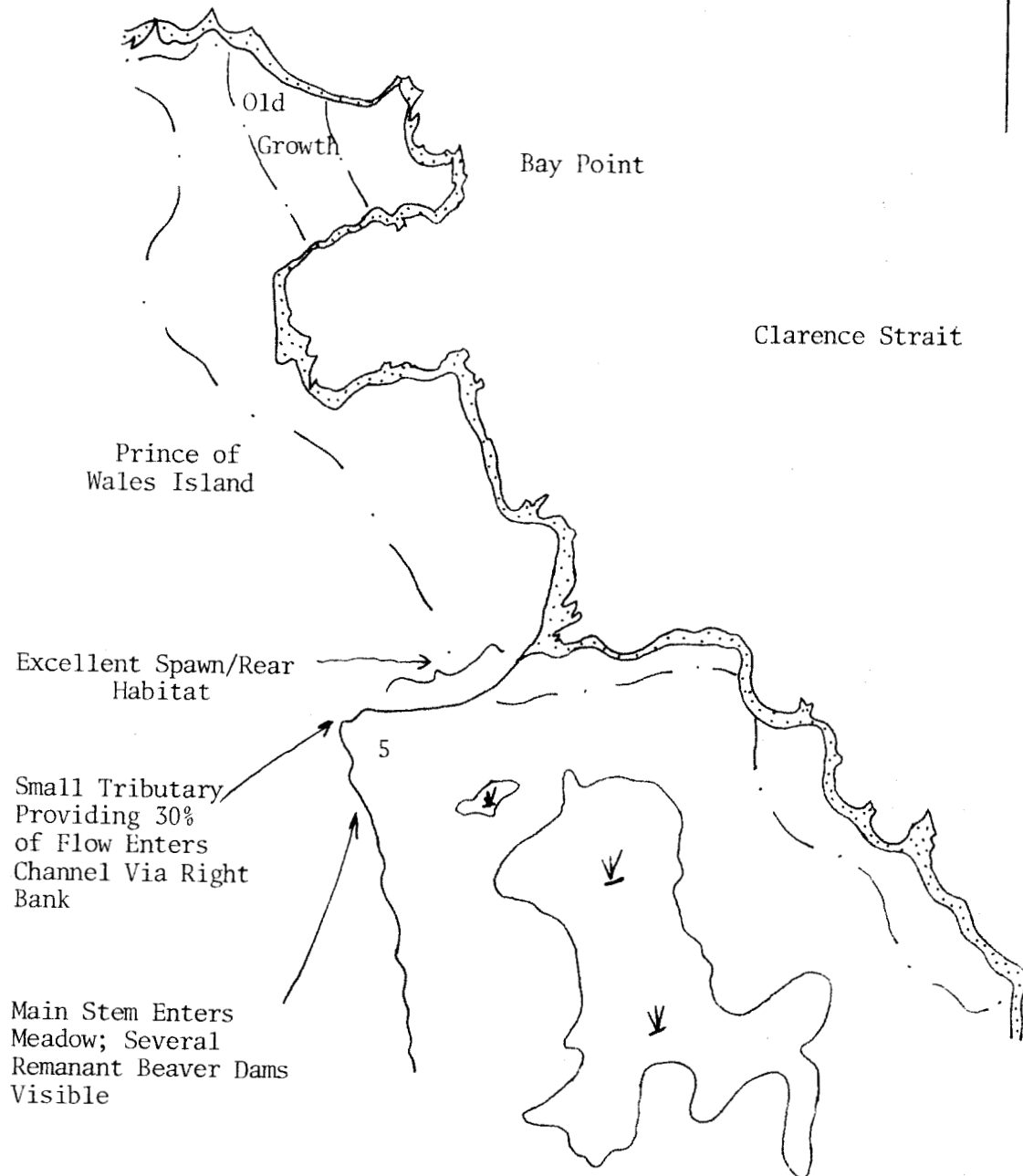
### Stream Evaluation

Copious fines throughout extensive ITZ riffles effectively reduce the quantity and quality of ASA.  
This small "muskeg drainage" is characterized by dark water, a predominantly cobble/gravel substrate heavily infiltrated by sand, and numerous muskeg seeps. Reach 1 provides good-excellent rearing in the form of debris/gradient induced "stair-step" pools and remanant beaver dams. The main stem becomes increasingly "slough-like" in Reach 2, culminating in a meadow meandering channel which ultimately drains a beaver dam/marsh system.

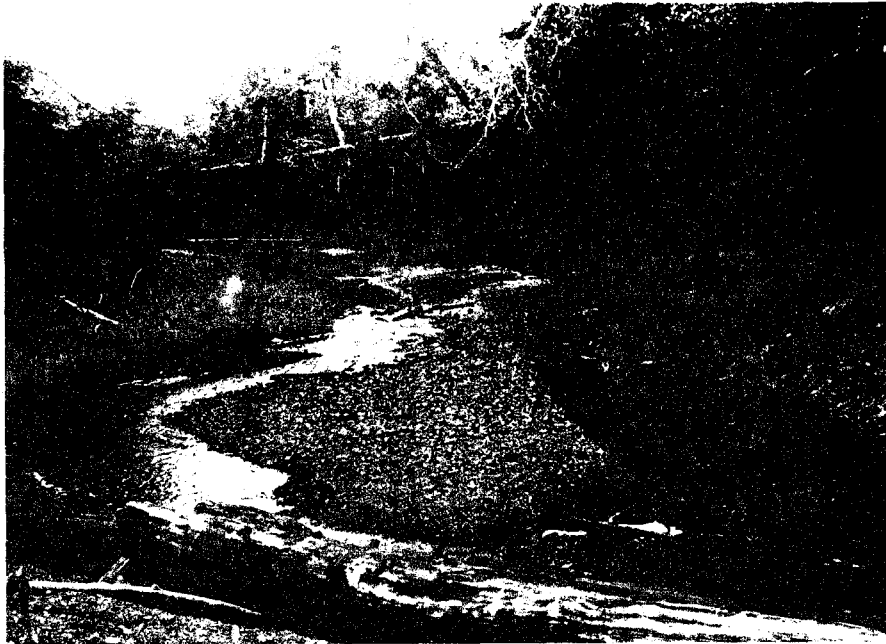
23. Investigators Ted Mickowski
24. Date 5/20/83

106-41-19  
Bay Creek

N



Bay Creek  
106-41-19



1. Upper Intertidal Zone contains several excellent spawning riffles; however, fines are common throughout system.



2. Section 4: Typical section in lower reach; excellent spawning riffles, common undercut banks, and abundant overhanging vegetation.

Bay Creek  
106-41-19



3. Section 7: Channel enters meadow becoming deep and slough-like. Vascular plants abundant, substrate primarily muck/fines.



4. Section 8: Survey ends at base of an extensive beaver induced impoundment. No fish observed above dam.



106-41-19

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	100	7.2	20	144.0					
2	100	6.2	10	62.0					
3	100	6.4	5	32.0					
4	100	3.3	8	26.4					
5	100	2.9	8	23.2					
6	100	3.9	5	<u>19.5</u>					
Total				307.1m <sup>2</sup>					

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Bay Creek 2. ADF&G Catalog No. 106-41-19

Reach Number	1	1	1	1	2	2	2
1. Section Number	1	2	3	4	5	6	7
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	231	238	261	254	291	358	150
4. Gradient	7	3	4	3	2.5	2.5	2.5
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	B	B	B	B	B	B	B
7. Bank Stability	1/1	1/1	1/1	1/1	1/1	1/1	1/1
8. Bank Vegetation	1-5	1-5	1-5	1-5	1-5	1,3-5	1,3-5
9. Debris Loading	8	15	7	5	15	15	8
10. Undercut Bank Length	--	65	50	65	75	55	25
11. Stream Width:							
Channel	9	6.2	6.4	3.3	5.5	3.9	3.6
Water	7.2	6.2	6.4	3.3	2.9	3.9	3.4
12. Water Type %: SS	10	25	15	20	20	25	15
DS	20	15	15	15	30	30	55
SF	70	60	70	65	50	45	20
DF	--	--	--	--	--	--	10
13. Substrate %:							
Bedrock	--	--	5	3	--	--	--
Boulder	--	2	15	15	5	2	2
Large Cobble	10	8	10	12	10	10	10
Small Cobble	40	30	25	25	30	30	30
Gravel	35	45	30	30	35	40	40
Sand	15	15	15	15	20	18	18
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	20/3	10/3	5/2	8/2	8/1	5/1	--
15. Rearing Area %	20	40	15	15	30	25	30
16. Pool Cover %	35	25	10	8	20	20	20
17. Riffle Cover %	15	15	5	5	5	5	5
18. Fish Observed							
19. Sampling	Y	Y	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 1-4: Old growth timber near mouth appears to have been logged from the beach years ago. Alder common throughout. Copious fines throughout riffle areas reduce ASA. Instream logs induce "ponding" and provide excellent rearing areas. Remnant beaver dams apparent and numerous muskeg seeps throughout.

Section 5: 40m; A small tributary representing approximately 30% of flow enters the main stem via the right bank and is characterized by low gradients and a narrow well-defined channel.

22. Investigators Ted Mickowski Date 5/20/83

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Bay Creek 2. ADF&G Catalog No. 106-41-19

Reach Number	2						
1. Section Number	8						
2. Section Length	100						
3. Compass Bearing	156						
4. Gradient	1						
5. Water Quality	4						
6. Bank Type	B						
7. Bank Stability	1/1						
8. Bank Vegetation	1,3-5						
9. Debris Loading	8						
10. Undercut Bank Length	--						
11. Stream Width:							
Channel	4.4						
Water	4.4						
12. Water Type %: SS	20						
DS	80						
SF	--						
DF	--						
13. Substrate %:							
Bedrock	--						
Boulder	--						
Large Cobble	--						
Small Cobble	20						
Gravel	20						
Sand	20						
Muck	20						
Other	20						
14. ASA %/Quality	--						
15. Rearing Area %	30						
16. Pool Cover %	20						
17. Riffle Cover %	--						
18. Fish Observed							
19. Sampling	N						
20. Potential Barriers	N						
21. Enhancement/Rehab	N						

22. Investigators Ted Mickowski Date 5/20/83

## LEVEL TWO HABITAT SURVEY

- Section 5: 40m; Resident rearing and spawning potential appears moderate.
- Section 6: A small tributary providing approximately 20% of flow enters the main stem via the right bank and is characterized by low gradients and a highly sinuous channel. Resident rearing and spawning potential appears moderate.
- Section 7: Main stem enters meadow. Several remnant beaver dams visible. Sinuous, typically deep channel contains moderate-heavy quantities of debris and organics. Abundant overhanging grass provides excellent streamside cover.

## FISH SAMPLING FORM

Stream Name Bay Creek ADF&G Catalog No. 106-41-29 Date 5/20/83

Identify Survey Area A Water Temp. 10°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1335	1545	CT - 2 DV - 1	--	Section 1
2	1340	1540	CT - 1	--	Section 2

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL TWO HABITAT SURVEY

## Part I.

1. Survey Areas "A"
2. Section Length variable
3. Historical Fish Species no data available

## Part II.

1. Stream Name n/a
2. ADF&G Catalog No. 106-41-18
3. Latitude 56°17'35"
- Longitude 133°10'05"
4. Agency Unit 05
5. Mgmt. Area 534
6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 22 610050 679-152
8. Bay/Drainage Salmon Bay
9. Access 02
10. Present Land Use none
11. Historical Land Use none
12. Stream Origin 5
13. Estimated Flow 15 cfs
14. Flow Stage 3
15. Stream Temperature 9.5°C
16. pH 6.0
17. Beaver yes
18. Temperature Sensitivity no
19. Barrier none
20. Weather 3

## Part III.

### 21. Intertidal

- A. Substrate: Fines 5% Gravel/S. Cob. 10%  
L. Cob/Boulder/Bedrock 85%
- B. Gradient 9%
- C. ASA % --
- D. Schooling no
- E. Shellfish no
- F. Anchorage Salmon Bay

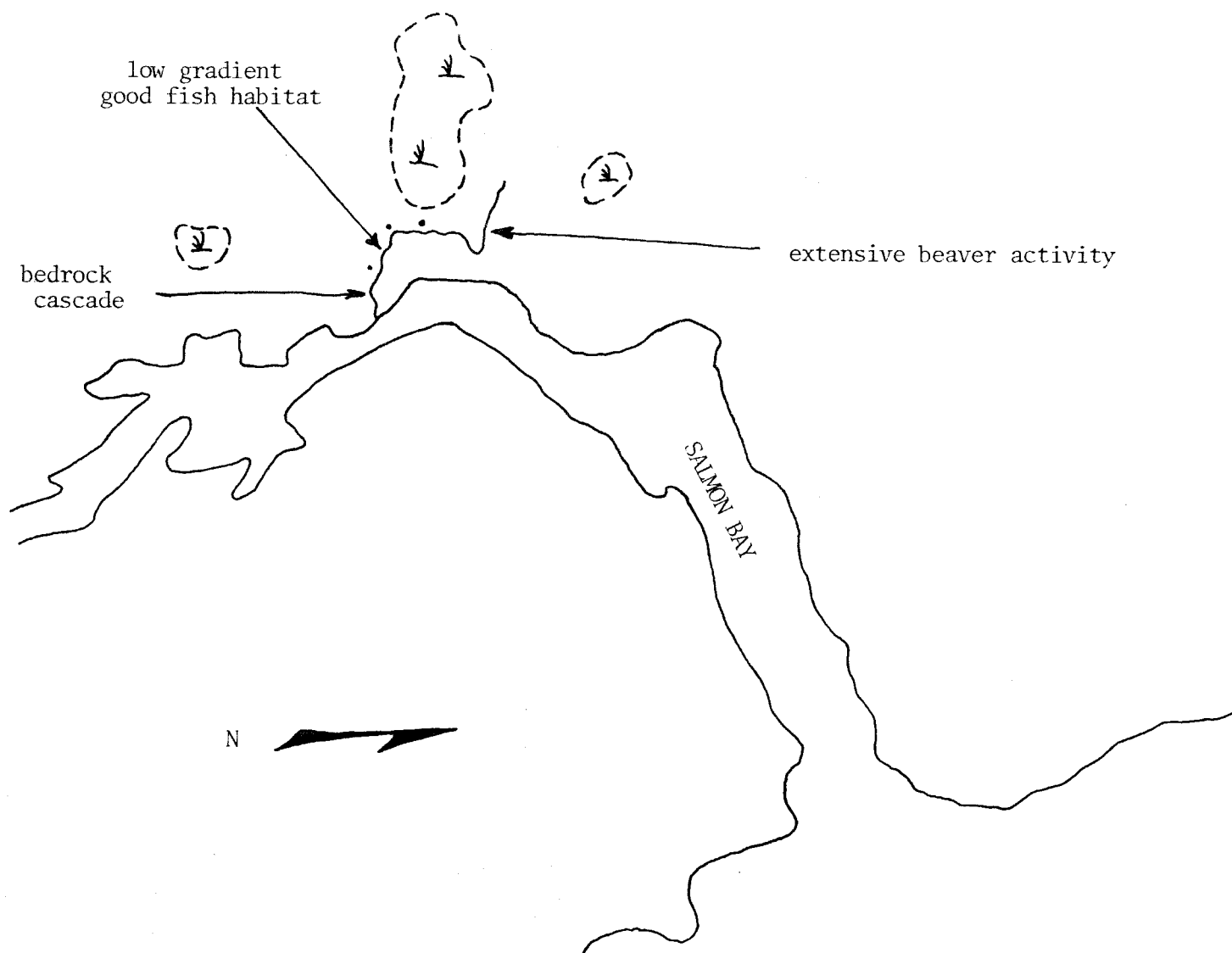
### 22. Comments

### Stream Evaluation

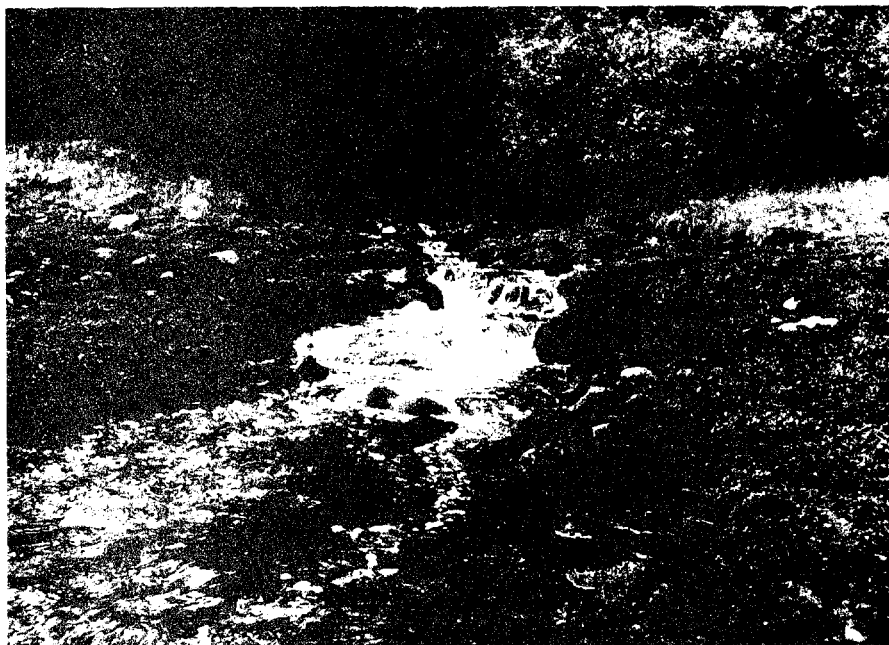
The first 120 m of this stream is cascaded on bedrock. No ASA or rearing was noted in this portion of the stream. An abrupt change in gradient occurs after 120 m. The stream then becomes a slow, meandering rearing channel. Spawning habitat also improves as the substrate size decreases. This stream was surveyed during high water. The survey was terminated at a beaver dam. A reconnaissance above revealed extensive beaver activity providing rearing habitat but no ASA.

23. Investigators Randy Ericksen
24. Date 5/20/83

106-41-18



106-41-18



1. Intertidal zone looking at mouth.

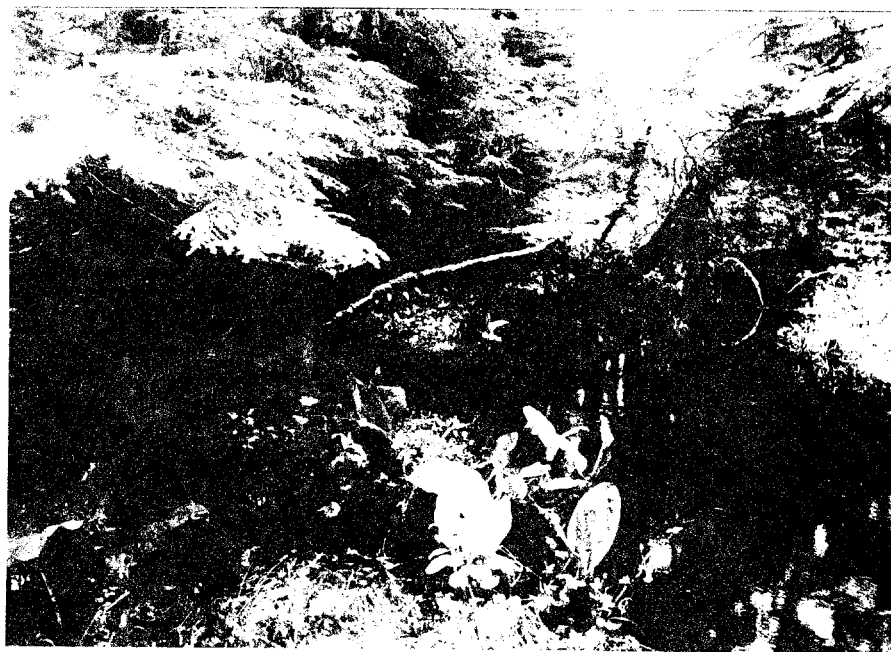


2. Section 1. Cascade area. No ASA.





3. Section 3. Good rearing. Fair ASA.



4. Beaver system above survey.

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	120	3.9	--	0					
2	100	2.6	5	13					
3	70	4.0	10	28					
Total				41.0m <sup>2</sup>					

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name n/a 2. ADF&G Catalog No. 106-41-18

Reach Number	1	2	3				
1. Section Number	1	2	3				
2. Section Length	120	100	70				
3. Compass Bearing	290	290	300				
4. Gradient	6.0	1.0	0.5				
5. Water Quality	4	4	4				
6. Bank Type	B	C	C				
7. Bank Stability	1/1	2/3	2/3				
8. Bank Vegetation	1-3	1,5	1,5				
9. Debris Loading	3	5	3				
10. Undercut Bank Length	--	150	100				
11. Stream Width:							
Channel	5.9	2.6	4.0				
Water	3.9	2.6	4.0				
12. Water Type %: SS	10	35	40				
DS	--	20	25				
SF	90	35	35				
DF	--	10	--				
13. Substrate %:							
Bedrock	40	5	--				
Boulder	30	5	--				
Large Cobble	10	5	2				
Small Cobble	15	15	10				
Gravel	5	40	30				
Sand	--	30	58				
Muck	--	--	--				
Other	--	--	--				
14. ASA %/Quality	--	5/2	10/2				
15. Rearing Area %	2	40	40				
16. Pool Cover %	0	10	2				
17. Riffle Cover %	2	10	5				
18. Fish Observed		CT	DV				
19. Sampling	Y	N	N				
20. Potential Barriers	N	N	N				
21. Enhancement/Rehab	N	N	N				

Section 1: Gradient high and substrate predominantly bedrock.

Section 2: Low gradient. Good rearing because of undercut banks, deep pools, riparian cover.

Section 3: Same as above. End survey at beaver dam.

22. Investigators Randy Ericksen Date 5/20/83

## FISH SAMPLING FORM

Stream Name n/a ADF&G Catalog No. 106-41-18 Date 5/20/83

Identify Survey Area "A" Water Temp. 9.5°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1320	1415	--	--	Section #1 in a back water pool.
2	1335	1435	1 CT	--	Section #2 near undercut bank.
3	1350	1425	1 DV	--	Just above first beaver dam in pond.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## LEVEL TWO HABITAT SURVEY

### Part I.

1. Survey Areas A (Main Stem only) 2. Section Length 100 m  
 3. Historical Fish Species no escapement data available

### Part II.

1. Stream Name Salmon Bay #1 2. ADF&G Catalog No. stream immediately south of 106-41-18  
 3. Latitude 56°18'10" Longitude 133°10'00"  
 4. Agency Unit 05 5. Mgmt. Area 534.1K 6. USGS Map No. Petersburg B-4  
 7. Aerial Photo No. 1979 Fl. Ln. 22 Roll 697 Photo 151  
 8. Bay/Drainage Salmon Bay 9. Access 2  
 10. Present Land Use recreational  
 11. Historical Land Use abandoned cannery at mouth of Salmon Bay  
 12. Stream Origin 3, 4, 5, 6 13. Estimated Flow 6.0 cfs 14. Flow Stage 3  
 15. Stream Temperature 9°C 16. pH 5.5 17. Beaver no  
 18. Temperature Sensitivity southeast exposure and low flow  
 19. Barrier no 20. Weather 3

### Part III.

#### 21. Intertidal

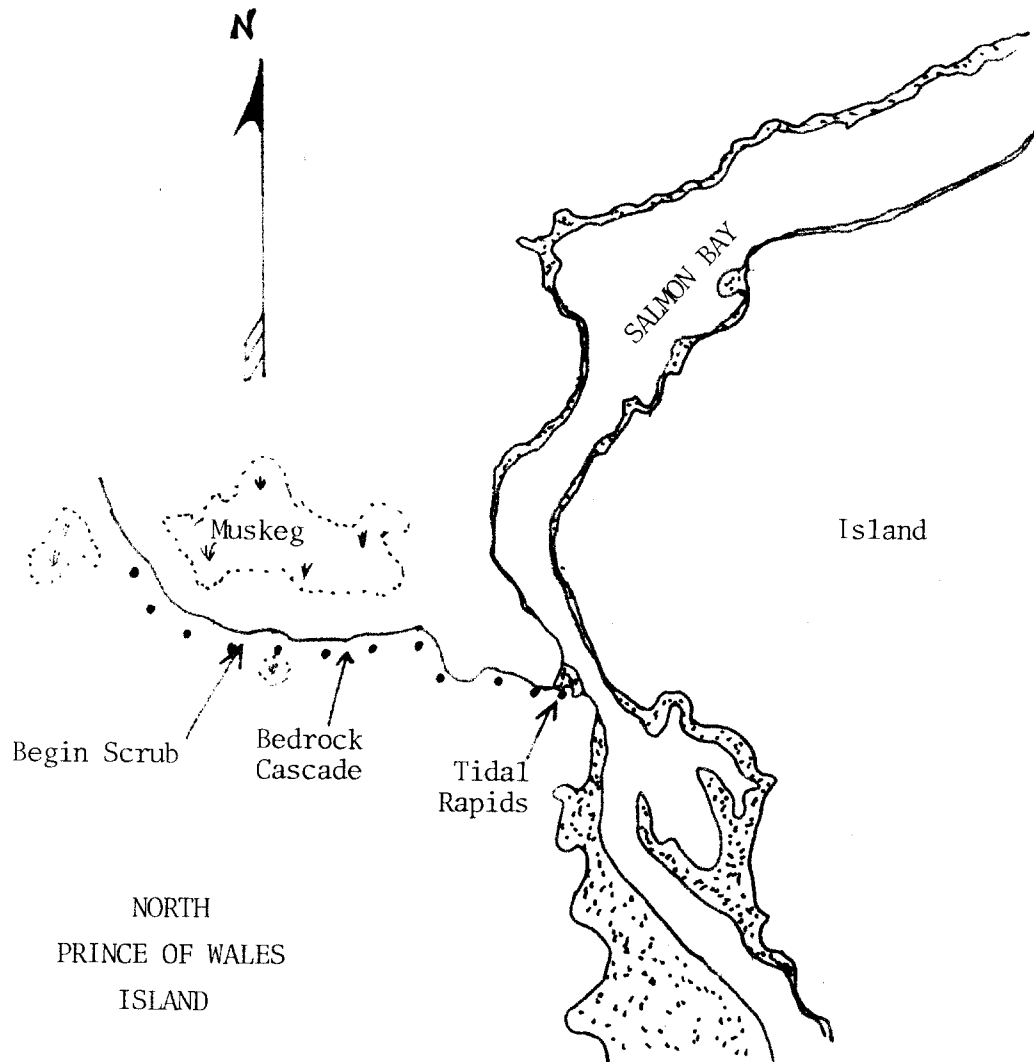
- A. Substrate: Fines 10 % Gravel/S. Cob. 20 %  
                   L. Cob/Boulder/Bedrock 70 %  
 B. Gradient 5 %  
 C. ASA % poor  
 D. Schooling in bay only  
 E. Shellfish none observed  
 F. Anchorage mouth of Salmon Bay

#### 22. Comments

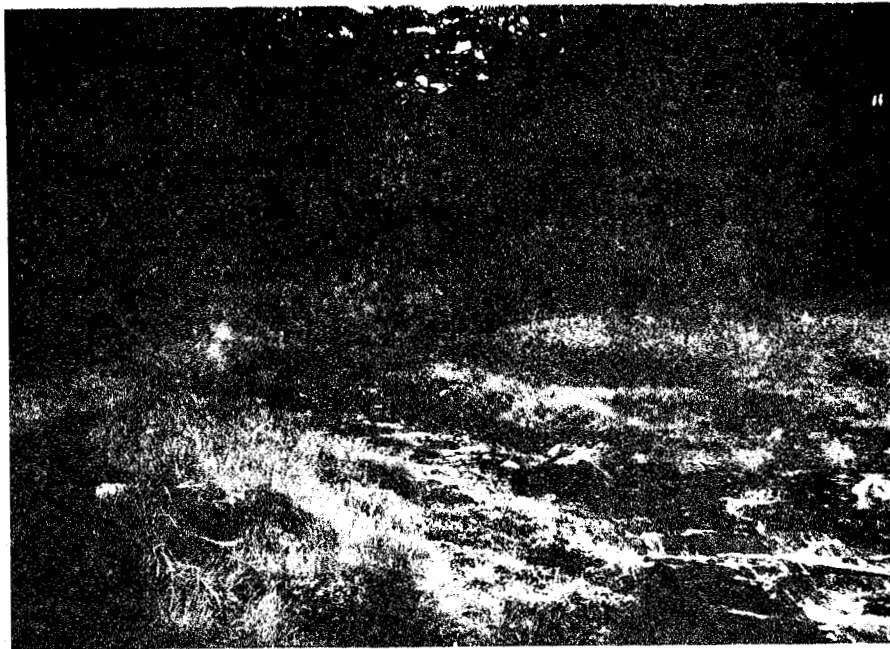
A small, sinuous muskeg drain, this stream is primarily rearing habitat with limited ASA, stable banks, deep pools, and overhanging cover providing the stream with rearing potential. However, normal stream flow is low as indicated by the presence of forbs instream. This flow, along with heavy aquatic vegetation on the boulder/cobble substrate, restricts the ASA. Trout fry and only a few coho fry were observed during the survey.

23. Investigators Gerry Merrigan 24. Date 5/20/83

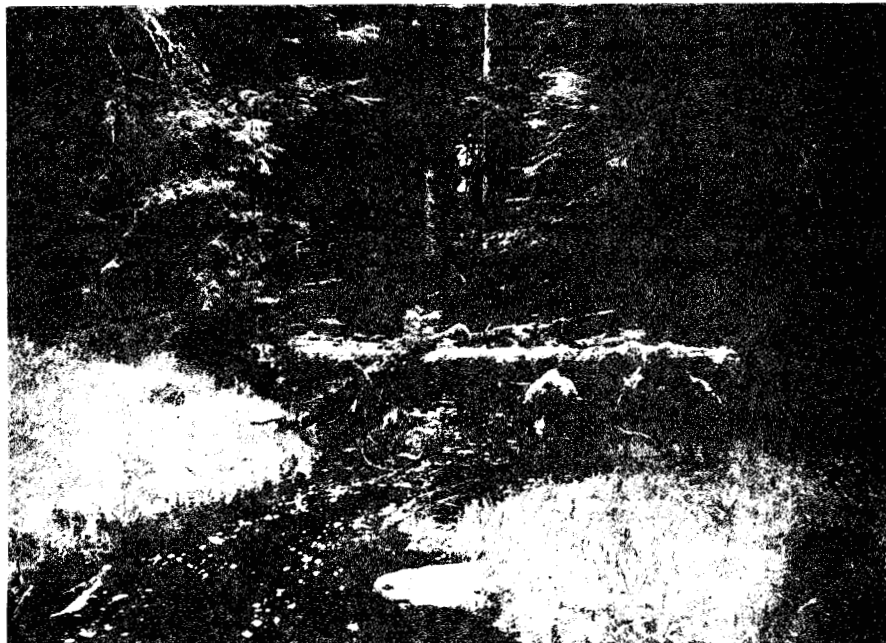
SALMON BAY #1



Salmon Bay #1



1. Intertidal area with rapids over boulder/cobble.



2. Mouth of stream, leaving grass meadow and entering forest cover.

Salmon Bay #1

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	100	2.0	2	4					
2	100	1.8	8	14.4					
3	100	2.0	5	10					
4	100	2.0	3	6					
5	100	2.5	0	0					
6	100	2.0	2	4					
7	100	1.5	0	0					
8	100	2.3	2	4.6					
9	100	2.2	0	0					
10	100	2.0	1	2					
11	100	2.0	0	0					
12	100	1.0	0	0					
Total				45.0m <sup>2</sup>					



# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Salmon Bay #1 2. ADF&G Catalog No. --

Reach Number	1	1	1	1	1	1	1
1. Section Number	1	2	3	4	5	6	7
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	325	310	280	245	245	290	310
4. Gradient	2.5	2.0	1.5	1.5	1.5	2.0	3.5
5. Water Quality	4	4	4	4	4	4	4
6. Bank Type	B	B	B	B	B	B	B
7. Bank Stability	1(1)	1(1)	1(1)	1(1)	1(1)	1(3)	1(1)
8. Bank Vegetation	1,3,4	1,3,4	1,3,4	1,3,4	1,3,4	1,3,4	1,3,4
9. Debris Loading	3	5	3	2	7	5	3
10. Undercut Bank Length	40	40	50	70	50	30	25
11. Stream Width:							
Channel	2.0	1.8	2.2	2.2	2.5	2.0	1.5
Water	2.0	1.8	2.0	2.0	2.5	2.0	1.5
12. Water Type %: SS	15	10	45	35	40	20	40
DS	10	20	30	30	35	30	30
SF	55	50	25	35	20	50	30
DF	20	20	--	--	5	--	--
13. Substrate %:							
Bedrock	5	--	10	10	5	20	--
Boulder	20	5	--	5	5	20	10
Large Cobble	10	--	5	--	--	5	5
Small Cobble	20	20	15	20	20	10	15
Gravel	25	65	50	60	40	35	35
Sand	15	5	10	5	20	15	10
Muck	5	5	10	--	10	5	15
Other	--	--	--	--	--	--	--
14. ASA %/Quality	2/2	8/2	5/1	3/1	--	2/1	--
15. Rearing Area %	40	40	30	30	50	30	50
16. Pool Cover %	35	25	15	10	20	20	20
17. Riffle Cover %	15	20	20	30	30	10	10
18. Fish Observed	SS,DV	--	DV	SS,DV	DV	--	--
19. Sampling	Y	Y	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 1: 0m; Begin forest cover; end grass meadow.

Section 6: 50m; Cascade over bedrock at 5% gradient. Bedrock substrate for 30 m.

22. Investigators Gerry Merrigan Date 5/20/83

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Salmon Bay #1 2. ADF&G Catalog No. --

Reach Number	1	1	1	1	1		
1. Section Number	8	9	10	11	12		
2. Section Length	100	100	100	100	100		
3. Compass Bearing	210	220	180	160	130		
4. Gradient	2.0	1.5	1.0	1.0	0.5		
5. Water Quality	4	4	4	4	4		
6. Bank Type	C	C	C	C	C		
7. Bank Stability	1(1)	1(3)	1(1)	1(1)	1(1)		
8. Bank Vegetation	1, 3-5	1, 3-5	1, 3-5	1-5	1, 3-5		
9. Debris Loading	2	2	10	3	5		
10. Undercut Bank Length	40	10	30	20	60		
11. Stream Width:							
Channel	2.3	2.2	2.0	2.0	1.0		
Water	2.3	2.2	2.0	2.0	1.0		
12. Water Type %:							
SS	30	40	40	65	40		
DS	20	20	20	15	10		
SF	40	40	40	20	50		
DF	10	--	--	--	--		
13. Substrate %:							
Bedrock	5	5	--	10	--		
Boulder	15	20	5	5	5		
Large Cobble	20	20	10	10	10		
Small Cobble	15	10	15	15	15		
Gravel	30	30	40	25	40		
Sand	7	10	20	25	20		
Muck	8	5	10	10	10		
Other	--	--	--	--	--		
14. ASA %/Quality	2/1	--	1/2	--	--		
15. Rearing Area %	35	30	30	25	15		
16. Pool Cover %	15	5	5	5	5		
17. Riffle Cover %	15	20	10	5	5		
18. Fish Observed	DV	--	DV	--	DV		
19. Sampling	N	N	N	N	N		
20. Potential Barriers	N	N	N	N	N		
21. Enhancement/Rehab	N	N	N	N	N		

Section 8: 60m; Bank vegetation transition from forest to scrub.

Section 12: 100m; pH 6.0. Stream is at edge of muskeg.

22. Investigators Gerry Merrigan Date 5/20/83

## FISH SAMPLING FORM

Stream Name Salmon Bay #1 ADF&G Catalog No. \_\_\_\_\_ Date 5/20/83

Identify Survey Area A (Main Stem) Water Temp. 9°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1240	1500	CT - 1		Section 1: 25 m
2	1250	1455	--		Section 2: 0 m

This form is used to record fish caught during Level Three, Four, or Five Surveys.

# LEVEL TWO HABITAT SURVEY

## Part I.

1. Survey Areas "A" Main stem 2. Section Length --
3. Historical Fish Species no escapement data available

## Part II.

1. Stream Name Salmon Bay #2 2. ADF&G Catalog No. --
3. Latitude 56°17'35" Longitude 133°00'05"
4. Agency Unit 05 5. Mgmt. Area 534-1K 6. USGS Map No. Petersburg B-4
7. Aerial Photo No. 1979 Photos Fl. Ln. 22 Photo 151
8. Bay/Drainage Salmon Bay, North 9. Access 2
10. Present Land Use Prince of Wales recreational
11. Historical Land Use none
12. Stream Origin 5, 6 13. Estimated Flow 2 cfs 14. Flow Stage 3
15. Stream Temperature 8.5 16. pH 5.0 17. Beaver No
18. Temperature Sensitivity small low flow; shallow stream
19. Barrier no 20. Weather 3

## Part III.

### 21. Intertidal

- A. Substrate: Fines 75 % Gravel/S. Cob. 15 %  
L. Cob/Boulder/Bedrock 10 %
- B. Gradient 3 %
- C. ASA % 0
- D. Schooling none, in bay only
- E. Shellfish none observed
- F. Anchorage mouth of Salmon Bay

### 22. Comments

### Stream Evaluation

Salmon Bay #2 is located in west Salmon Bay above 106-41-10 and below Salmon Bay #1. A narrow (1.0 m wide) low gradient stream, Salmon Bay #2 flows over a substrate of silt, sand and organic debris. Good cover with considerable blowdown provides good rearing habitat but no spawning habitat is present. Only trout fry were observed at time of survey.

23. Investigators Gerry Merrigan 24. Date 5/20/83

Salmon Bay #2



1. Upper ITZ and mouth of Salmon Bay #2.



2. Downstream view of ITZ looking towards Salmon Bay.

## LEVEL TWO HABITAT SURVEY

### Part I.

1. Survey Areas "A" Main Stem  
"B" Tributary 2. Section Length variable  
 3. Historical Fish Species RS, SS, PS (SEE "Escapement Record")

### Part II.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10  
 3. Latitude 56°18'15"N Longitude 133°10'00"E  
 4. Agency Unit 05 5. Mgmt. Area 534K 6. USGS Map No. Petersburg B-4  
 7. Aerial Photo No. 21 610050 679-164  
 8. Bay/Drainage Salmon Bay 9. Access USFS trail, 2  
 10. Present Land Use recreational  
 11. Historical Land Use none  
 12. Stream Origin 1, 5 13. Estimated Flow 40 cfs 14. Flow Stage 2  
 15. Stream Temperature 8°C 16. pH 7.5 17. Beaver active dams  
on tributary  
 18. Temperature Sensitivity no  
 19. Barrier 2 on tributary only 20. Weather 2

### Part III.

#### 21. Intertidal

A. Substrate: Fines 35 % Gravel/S. Cob. 47 %  
L. Cob/Boulder/Bedrock 18 %  
 B. Gradient 0.5 %  
 C. ASA % 45/fair  
 D. Schooling just above ITZ  
 E. Shellfish none  
 F. Anchorage Salmon Bay

#### 22. Comments

#### Stream Evaluation

This large stream drains Salmon Bay Lake, a major sockeye salmon system. Reach 1, the ITZ, is quite extensive and braided. Hummingbirds, eagles, and coho fry were prevalent along the estuary. Wolf, deer and bear sign were observed along the length of the main stem. A USFS trail begins near the mouth of the stream, runs parallel to the main stem up to the lake. A major tributary enters the main stem 550 m below the lake. ADF&G operates a weir on the main stem just above the confluence during the summer months. Reach 2 begins just above the ITZ and is characterized as having poor ASA because of large substrate. Reach 3 had significantly lower gradient, large pools, extensive riparian cover, and excellent gravel. Reach 4 consists of a 200 m stretch of deeper, faster water. Bedrock outcroppings

23. Investigators Gerry Merrigan & Randy Ericksen 24. Date 5/12/83

LEVEL TWO HABITAT SURVEY

Salmon Bay Creek  
106-41-10

22. Comments Cont.

were interspersed throughout the reach. Tributary B enters along the right bank near the end of this reach. Reach 5 had extremely low gradient making it slough-like in appearance. Substrate consisted mostly of sand and muck.

Salmon Bay Creek  
106-41-10  
Survey Area "B": Right Fork

A major component of Salmon Bay Creek, this fork enters the main stem of the outlet stream at Section 6: 150 m.

REACH ANALYSIS

Reach 1

At the confluence with the main stem, the fork is crossed by a footbridge for a recreational trail. At this point, and throughout the reach, the stream is broad and shallow with low velocity and gradient. Substrate is predominantly gravel with heavy interstitial fines. Occasional patches of bedrock are spotty throughout the reach.

This reach of 1500 m has potential for good ASA, but the stream velocity and gradient are too slow and low respectively. Spawning gravel is present but aeration is inadequate. Consequently, most of the available spawning area is of poor quality, but rearing habitat is good due to the large amount of pool area.

At Section 22: 100 m, a tributary on the right bank drains an extensive beaver system. This previously was a major tributary prior to beaver activity. Coho fry were observed behind the dam.

Reach 2

This reach (1200 m) is characterized by reduced stream flow and channel width but with slightly increased gradient and velocity. Substrate is predominantly gravel and sand with good ASA in spotty patches. Additional beaver activity was observed in Section 24 on a tributary that drains a beaver pond on the left side.

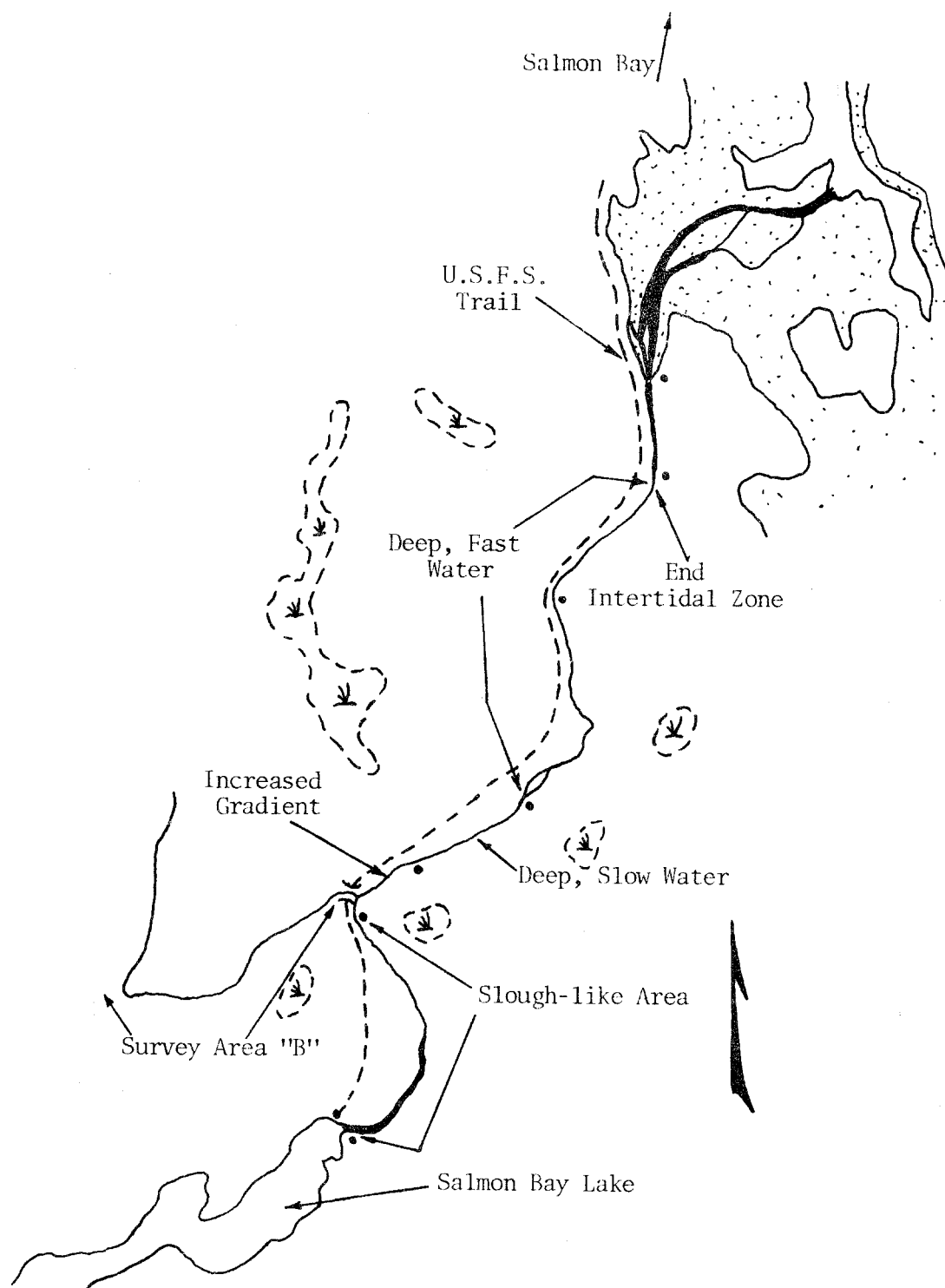
Reach 3

Increased gradient and substrate size (mostly cobble) brings ASA up considerably (especially for coho) with a riffle/pool ratio of about 4:1. Streamside banks have begun to steepen, and the streamcourse is gradually becoming more channelized. Predominantly trout fry were observed in this reach of 400 m.

Reach 4

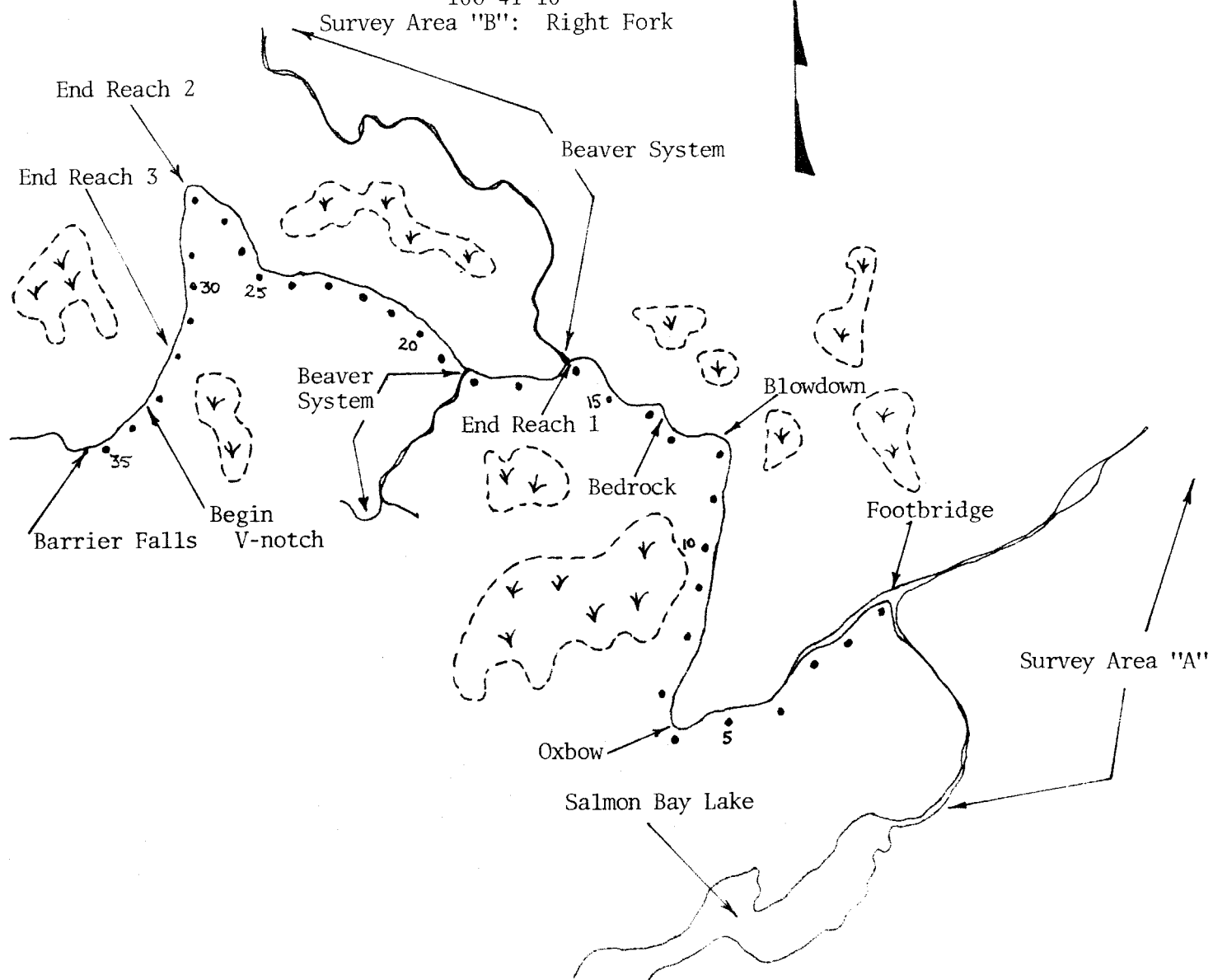
Constituting the upper end of the survey, this reach of 290 m is characterized by lack of habitat. Substrate size increases to boulder and bedrock proportion. Gradient sharply increases (1.5% to 4%) as ASA sharply declines. At 100 m in the reach, the stream course enters a V-notch culminating in a series of 2 (3.0 m) barrier falls over bedrock. Reconnaissance above the falls found no significant habitat, hence no recommendation for enhancement.





SALMON BAY CREEK  
Survey Area "A"

Salmon Bay Creek  
106-41-10



Salmon Bay Creek  
Survey Area "A"



1. Section 1: ITZ looking downstream.



2. Section 4: Deep, fast water over bedrock and boulder substrate.

Salmon Bay Creek  
Survey Area "A"



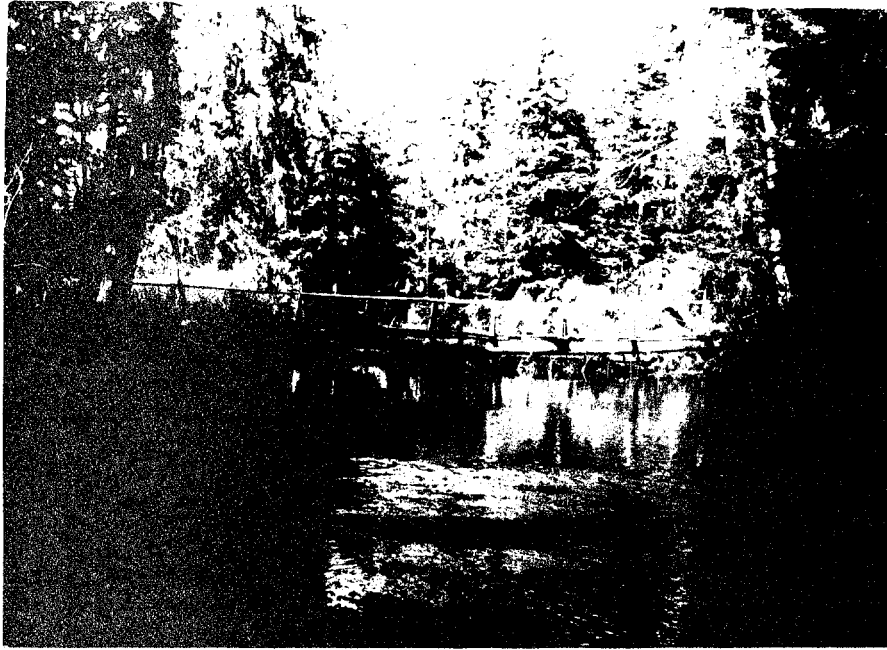
3. Section 5: Riparian vegetation along deep, slow water.

Salmon Bay Creek  
Survey Area "A"

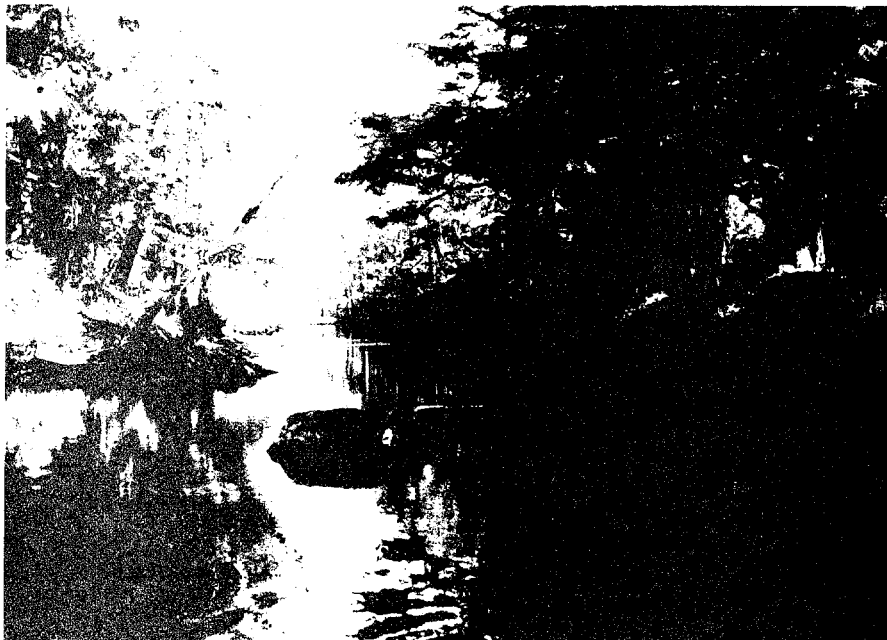


4. Section 7: Showing "slough-like" area below lake.

Salmon Bay Creek  
Survey Area "B"



5. Mouth of Survey Area "B": Right Fork with footbridge crossing.



6. Reach 1; Section 2; Right Fork: Broad channel width with low velocity and gradient.

Salmon Bay Creek  
Survey Area "B"

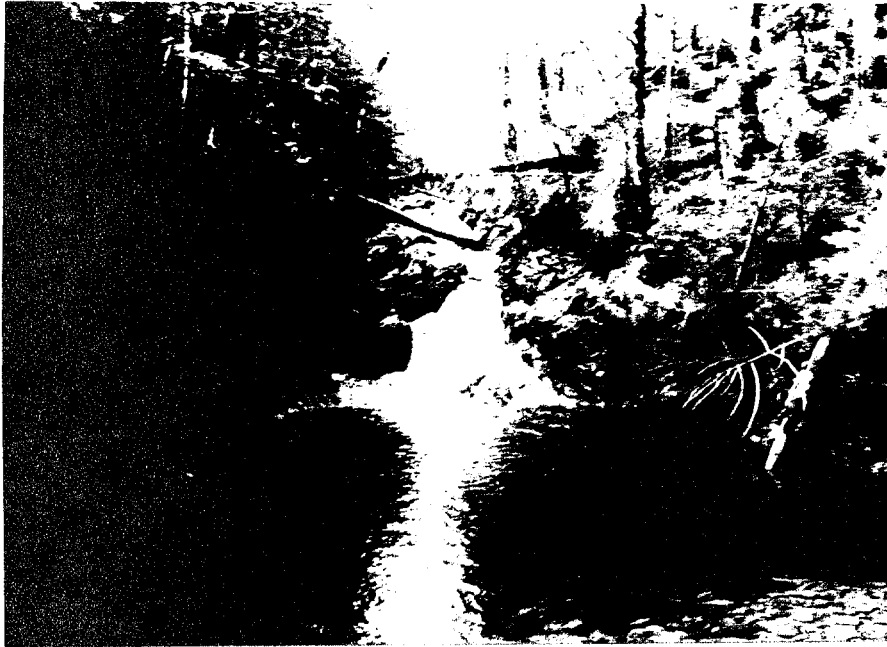


7. End of Reach 1; Survey Area "B": Right Fork. Stream course and Reach 2 to left; beaver system to right.



8. Reach 3; Survey Area "B": Right Fork. Riffle area between steepening banks.

Salmon Bay Creek  
Survey Area "B"



9. Reach 4; Survey Area "B": Right Fork. V-notch ending in series of 2-3.0 m barrier falls.



Salmon Bay Creek  
106-41-10

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Survey Area "A"					16	100	4.7	20	94
1I	400	25.1	45	4518	17	100	4.7	10	47
2I	250	23.5	35	2056	18	100	4.7	5	24
Total Intertidal ASA				6574m <sup>2</sup>	19	100	4.7	20	94
3	500	16.4	10	820	20	100	4.7	40	188
4	320	25.0	5	400	21	100	3.0	35	105
5	450	15.9	20	1431	22	100	3.0	15	45
6	200	17.1	10	342	23	100	3.0	30	90
7	500	18.9	5	473	24	100	3.0	35	105
Total Survey Area "A" ASA				10,040m <sup>2</sup>	25	100	3.0	35	105
Survey Area "B"					26	100	9.5	35	333
1	100	15.0	--	--	27	100	9.5	25	238
2	100	15.0	--	--	28	100	10.5	30	315
3	100	15.0	10	150	29	100	10.5	20	210
4	100	15.0	30	450	30	100	10.5	35	368
5	100	15.0	35	525	31	100	10.5	25	263
6	100	8.0	40	320	32	100	10.5	15	158
7	100	8.0	--	--	33	100	9.0	15	135
8	100	8.0	20	160	34	100	9.0	3	27
9	100	8.0	40	320	35	90	9.0	--	--
10	100	8.0	30	240	Total Survey Area "B" ASA				5,955m <sup>2</sup>
11	100	9.4	20	188	Total ASA				15,995m <sup>2</sup>
12	100	9.4	15	141					
13	100	9.4	5	47					
14	100	9.4	20	188					
15	100	9.4	30	282					

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10

Reach Number	1	1	2	2	3	4	5
1. Section Number	1I	2I	3	4	5	6	7
2. Section Length	400	250	500	320	450	200	500
3. Compass Bearing	--	200	160	215	275	150	230
4. Gradient	0.5	0.5	1.5	3.0	1.5	2.0	0.5
5. Water Quality	3	3	3	3	3	3	3
6. Bank Type	A	B	B	B	B	B	A
7. Bank Stability	--	--	--	--	--	--	--
8. Bank Vegetation	5	1-5	1,3,4	1-4	1-5	1,3,4	1-5
9. Debris Loading	2	2	2	3	3	5	1
10. Undercut Bank Length	--	--	--	--	110	10	30
11. Stream Width:							
Channel	30.0	24.0	16.8	31.0	19.0	17.8	18.9
Water	25.1	23.5	16.4	25.0	15.9	17.1	18.9
12. Water Type %: SS	30	10	5	10	10	5	50
DS	--	10	10	5	50	5	30
SF	60	50	55	55	20	60	20
DF	10	30	30	30	20	30	--
13. Substrate %:							
Bedrock	0	0	15	10	5	30	0
Boulder	0	10	17	25	0	15	5
Large Cobble	8	30	18	25	0	5	0
Small Cobble	27	30	20	10	10	10	5
Gravel	30	25	15	5	60	10	15
Sand	30	5	15	25	20	10	60
Muck	5	0	0	0	5	20	15
Other	--	--	--	--	--	--	--
14. ASA %/Quality	45/1	35/1	10/2	5/2	20/2	10/2	5/1
15. Rearing Area %	5	15	15	15	25	5	80
16. Pool Cover %	--	1	1	3	10	2	1
17. Riffle Cover %	--	1	1	1	5	2	1
18. Fish Observed	SS	SS	SS		SB	CT	SB
						DV	
19. Sampling	N	N	Y	N	Y	N	Y
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 1I: Extensive tidal flat, extremely braided. Good ASA but few pools. Begin survey just below braided area.

Section 2I: Begin section at tree line. Continue good ASA but deeper, faster water. SS fry abundant.

Section 4: Predominantly large substrate, poor ASA. Section ends just above a 100 m-long island. Rearing habitat is poor due to fast water.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/12/83

## LEVEL TWO HABITAT SURVEY

Salmon Bay Creek  
106-41-10  
Survey Area "A"

- Section 5: Low gradient and deep, slow water. Riparian vegetation provides excellent cover along the banks. Substrate consists largely of sand and gravel.
- Section 6: Increased gradient; stream becomes swift. Major tributary "B" begins at 150 m. Several adult cutthroat trout were caught just above the tributary.
- Section 7: Very low gradient. Substrate consists largely of sand. Bank vegetation is made up of grasses and shrubs. Poor ASA and fair rearing habitat.

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10

Survey Area "B": Right Fork

Reach Number	1	1	1	1	1	1	1
1. Section Number	1	2	3	4	5	6	7
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	245	--	--	--	--	295	--
4. Gradient	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5. Water Quality	3	3	3	3	3	3	3
6. Bank Type	A	A	A	A	A	A	A
7. Bank Stability	1(1)	1(1)	1(1)	1(1)	1(1)	1(1)	1(1)
8. Bank Vegetation	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3
9. Debris Loading	10	2	2	4	10	10	1
10. Undercut Bank Length	80	100	140	50	20	90	100
11. Stream Width:							
Channel	15.0	--	--	--	--	12.6	12.6
Water	15.0	--	--	--	--	2/6	8.0
12. Water Type %: SS	70	70	90	20	30	40	50
DS	30	30	10	40	40	60	50
SF	--	--	--	40	30	--	--
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	--	--	--	4	5	--	--
Boulder	--	5	5	5	--	--	--
Large Cobble	--	10	10	25	5	5	5
Small Cobble	--	20	20	50	20	20	30
Gravel	60	50	50	16	60	60	50
Sand	30	15	15	--	10	15	15
Muck	10	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	--	--	10/2	30/3	35/3	40/2	--
15. Rearing Area %	100	100	60	60	50	60	100
16. Pool Cover %	10	2	2	10	5	10	2
17. Riffle Cover %	--	--	--	20	10	3	--
18. Fish Observed	SS	SS	SS	SS	SS	SS	SS
19. Sampling	N	N	N	N	N	Y	Y
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 1: 0m; Shallow, wide stream with low gradient over gravel with heavy interstitial fines. Wide floodplain on both banks. Flow is approximately 15 cfs. Temperature is 8°C.

Section 3: 50m; Stream channel narrowing as gradient increases slightly. Isolated patches of blue clay. Beaver and otter sign present.

Section 6: 0m; pH is approximately 7.7.  
50m; Oxbow island with cut-off channel.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/12/83

LEVEL TWO HABITAT SURVEY

Salmon Bay Creek

106-41-10

Survey Area "B"

Section 7: 0m; Gradient decreasing forming a wide well-contained stream of pools with heavy fines content.

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10

Survey Area "B": Right Fork

Reach Number	1	1	1	1	1	1	1
1. Section Number	8	9	10	11	12	13	14
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	--	--	--	020	--	--	--
4. Gradient	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5. Water Quality	3	3	3	3	3	3	3
6. Bank Type	A	A	A	A	A	A	A
7. Bank Stability	1(1)	1(1)	1(1)	1(1)	1(1)	1(1)	1(1)
8. Bank Vegetation	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3
9. Debris Loading	3	5	20	--	25	5	3
10. Undercut Bank Length	40	40	50	20	40	20	50
11. Stream Width:							
Channel	--	--	--	18.4	--	--	--
Water	--	--	--	9.4	--	--	--
12. Water Type %: SS	40	25	30	30	30	40	30
DS	40	25	20	10	10	10	30
SF	20	50	50	60	60	50	40
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	--	--	3	10	10	20	20
Boulder	--	2	5	5	5	20	5
Large Cobble	5	5	20	20	20	10	20
Small Cobble	25	40	30	20	20	5	10
Gravel	50	40	30	30	25	25	25
Sand	20	13	12	15	20	20	20
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	20/2	40/2	30/2	20/2	15/2	5/2	20/2
15. Rearing Area %	80	50	30	30	40	10	30
16. Pool Cover %	5	10	30	0	40	5	25
17. Riffle Cover %	--	5	20	--	35	5	--
18. Fish Observed	SS	SS	SS	SS	SS	SS	SS
19. Sampling	N	N	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 11: 0m; Stream is wide and shallow.

Section 12: 50m; Tributary right side. Muskeg drain; no significant habitat. Heavy blowdown.

Section 13: 50m; Bedrock substrate (slate) for 50 m.

Section 14: 25m; Tributary right side from beaver pond.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/12/83

LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10

Survey Area "B"

Reach Number	1	2	2	2	2	2	2
1. Section Number	15	16	17	18	19	20	21
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	--	210	--	--	--	--	--
4. Gradient	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5. Water Quality	3	3	3	3	3	3	3
6. Bank Type	A	A	A	A	A	A	A
7. Bank Stability	1(1)	2(1)	2(1)	2(1)	2(1)	2(1)	2(1)
8. Bank Vegetation	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3
9. Debris Loading	15	20	15	5	3	5	5
10. Undercut Bank Length	40	40	60	50	30	40	50
11. Stream Width:							
Channel	--	10.0	--	--	--	--	15.0
Water	--	4.7	--	--	--	--	2.0/1.0
12. Water Type %: SS	50	30	30	40	30	20	50
DS	--	40	20	20	10	20	20
SF	50	30	50	40	60	60	30
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	10	--	--	--	--	--	--
Boulder	20	--	--	--	--	--	--
Large Cobble	20	5	5	--	--	--	--
Small Cobble	30	15	25	20	25	25	20
Gravel	20	50	40	50	50	60	60
Sand	--	20	30	30	25	15	20
Muck	--	--	--	--	--	--	--
Other	--	Clay10	--	--	--	--	--
14. ASA %/Quality	30/2	20/3	10/3	5/3	20/3	40/3	35/3
15. Rearing Area %	50	40	50	50	30	40	15
16. Pool Cover %	25	25	20	20	5	5	5
17. Riffle Cover %	5	5	5	20	--	5	5
18. Fish Observed	SS	SS	SS	SS	SS	SS	--
19. Sampling	N	N	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 15: 50m; Numerous tributaries right side from beaver pond.  
100m; Tributary right side from beaver dam (2.0m x 14.0 m)  
forming large beaver/marsh system. Coho fry observed in pond.

Section 16: 0m; Decreased stream flow; narrowing stream channel. No  
bedrock outcrops.

25m; Blue clay left side for 20 m.

Section 17: 90m; Tributary left side from active beaver pond.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/12/83

# LEVEL TWO HABITAT SURVEY

## Part IV.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10

Survey Area "B": Right Fork

Reach Number	2	2	2	2	2	2	3
1. Section Number	22	23	24	25	26	27	28
2. Section Length	100	100	100	100	100	100	100
3. Compass Bearing	--	--	--	--	330	--	170
4. Gradient	0.5	0.5	0.5	0.5	1.0	1.0	1.5
5. Water Quality	3	3	3	3	3	3	1
6. Bank Type	A	A	A	A	A	A	B
7. Bank Stability	2(1)	2(1)	2(1)	2(1)	1(1)	1(1)	1(2)
8. Bank Vegetation	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	1,3
9. Debris Loading	5	15	10	10	3	--	1
10. Undercut Bank Length	30	40	30	20	60	5	5
11. Stream Width:							
Channel	--	--	--	--	15.0	--	11.5
Water	--	--	--	--	9.5	--	10.5
12. Water Type %:							
SS	30	35	40	40	30	20	40
DS	40	25	20	20	30	10	--
SF	30	40	40	40	40	70	60
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	--	--	--	--	--	10	2
Boulder	--	--	--	--	--	--	5
Large Cobble	--	--	--	--	10	10	20
Small Cobble	20	20	20	20	25	30	30
Gravel	60	55	60	60	60	45	38
Sand	20	20	20	20	5	5	5
Muck	--	--	--	--	--	--	--
Other	--	5/B	--	--	--	--	--
14. ASA %/Quality	15/2	30/2	35/2	35/2	35/3	25/3	30/3
15. Rearing Area %	50	30	20	20	30	10	20
16. Pool Cover %	5	20	10	10	40	--	--
17. Riffle Cover %	--	30	5	5	5	--	--
18. Fish Observed	SS	SS	SS	SS	SS	SS	SS
19. Sampling	Y	N	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 27 : 70m; Bedrock outcrop.

Section 28 : 0m; Steepening banks with increasing gradient and ASA. Increased amount of riffles with few fines; mostly cobble/gravel substrate.  
Temperature: 9°C.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/12/83



LEVEL TWO HABITAT SURVEY

Part IV.

1. Stream Name Salmon Bay Creek 2. ADF&G Catalog No. 106-41-10

Survey Area "B": Right Fork

Reach Number	3	3	3	3	3	3	4
1. Section Number	29	30	31	32	33	34	35
2. Section Length	100	100	100	100	100	100	90
3. Compass Bearing	--	--	--	--	220	--	--
4. Gradient	1.5	1.5	1.5	1.5	1.5	3.0	4.0
5. Water Quality	1	1	1	1	1	1	1
6. Bank Type	B	B	B	B	B	B	B
7. Bank Stability	1(2)	1(2)	1(2)	1(2)	1(2)	1(2)	1(2)
8. Bank Vegetation	1,3	1,3	1,3	1,3	1,2,3	1,2,3	1,2,3
9. Debris Loading	1	2	1	3	1	--	--
10. Undercut Bank Length	10	10	30	50	20	--	--
11. Stream Width:							
Channel	--	--	--	--	13.0	--	--
Water	--	--	--	--	9.0	--	--
12. Water Type %: SS	40	40	30	40	45	40	50
DS	--	10	10	10	45	30	30
SF	60	50	60	50	10	30	20
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	10	10	20	10	10	30	20
Boulder	30	35	10	10	20	20	20
Large Cobble	30	25	30	40	40	30	40
Small Cobble	25	25	20	15	20	10	10
Gravel	5	5	20	20	10	10	10
Sand	--	--	--	5	--	--	--
Muck	--	--	--	--	--	--	--
Other	--	--	--	--	--	--	--
14. ASA %/Quality	20/3	35/3	25/3	15/3	15/2	3/2	--
15. Rearing Area %	20	15	20	20	10	20	30
16. Pool Cover %	--	--	2	5	--	--	--
17. Riffle Cover %	20	20	5	10	15	10	15
18. Fish Observed	SS	SS	SS	CT	CT	--	--
	CT	CT	CT				
19. Sampling	N	N	N	N	N	N	N
20. Potential Barriers	N	N	N	N	N	N	Y3
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 33: 0m; Increasing gradient and substrate size; decreasing ASA.

Section 34: 0m; Begin V-notch. No fish.

Section 35: 0m; Begin discontinuous patches of bedrock.

20m; Tributary left side with no significant habitat.

90m; Series of 2 (3.0 m) falls over bedrock.

Reconnaissance Above Falls: Habitat above falls consists of continuous cascades and pools over bedrock with 0 ASA. After 250 m, another barrier falls occurs. Not suitable for enhancement.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/12/83

## FISH SAMPLING FORM

Stream Name Salmon Bay Creek ADF&G Catalog No. 106-41-10 Date 5/12/83

Identify Survey Area A & B Water Temp. 8°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	0955	1500	7 SB		Section 7
2	1015	1410	1 SB		Section 5
3	1045	1145	--		Section 3
4	1045	1600	--		Survey Area "B"; Section 6

This form is used to record fish caught during Level Three, Four, or Five Surveys.

PEAK ESCAPEMENT RECORD

Salmon Bay Creek  
106-41-10

DATE	PINK	CHUM	OTHER SPECIES		REMARKS
			SS	RS	
1960				400	
1961					
1962				10,450	
1963				3,900	
1964	9,000			3,000	
1965	5,000		11	11,269	
1966	8,000			6,230	
1967				8,835	
1968	300			8,034	
1969				500	
1970	1,003		23	0	
1971	5,000			300	
1972				6,300	
1973				0	
1974	100			2,581	
1975				2,550	
1976				1,935	
1977				0	
1978					
1979	245				
1980	413				
1981	690			1,900	
1982	5,050		1,924	16,041	

LEVEL TWO HABITAT SURVEY

Part I.

1. Survey Areas A (Main Stem only) 2. Section Length 500 m  
3. Historical Fish Species no escapement data available

Part II.

1. Stream Name East Headwater Salmon Bay Lake 2. ADF&G Catalog No. 106-41-05  
3. Latitude 56°13'40" Longitude 133°10'05"  
4. Agency Unit 05 5. Mgmt. Area 534 K 6. USGS Map No. Petersburg B-4  
7. Aerial Photo No. 1979 Photos Fl. Ln. 12 Photo 145  
8. Bay/Drainage Salmon Bay Lake 9. Access 2  
10. Present Land Use recreational; USFS cabin on lake  
11. Historical Land Use none  
12. Stream Origin 4, 5 13. Estimated Flow 2 cfs 14. Flow Stage 1  
15. Stream Temperature 7°C 16. pH 7.4 17. Beaver yes  
18. Temperature Sensitivity slow, shallow stream over low gradient  
19. Barrier yes, Section 2: 68 m; cascade with debris 20. Weather 6

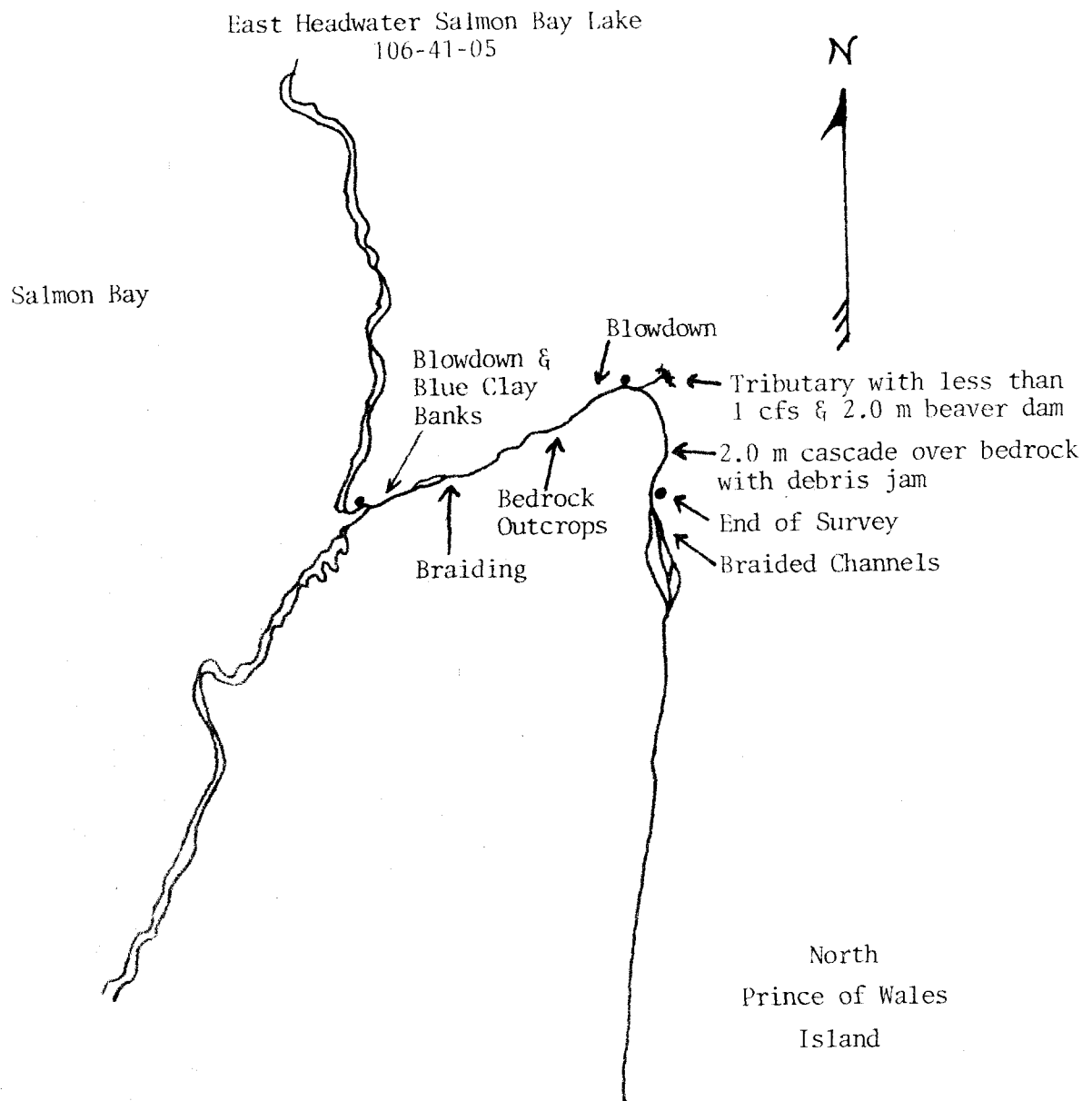
Part III.

21. Intertidal - none, lake system  
A. Substrate: Fines        % Gravel/S. Cob.        %  
L. Cob/Boulder/Bedrock        %  
B. Gradient        %  
C. ASA %         
D. Schooling         
E. Shellfish         
F. Anchorage

22. Comments

Essentially a muskeg watershed drainage. The stream is characterized by low velocity with many instream forbs. Due to shallowness and low gradient, stream is potentially temperature sensitive. Spawning gravel is patchy throughout stream, and lake gravel at stream mouth is poor sockeye spawning area due to location of clay banks immediately upstream. Trout only observed in stream with no fish sampled via fish trapping.

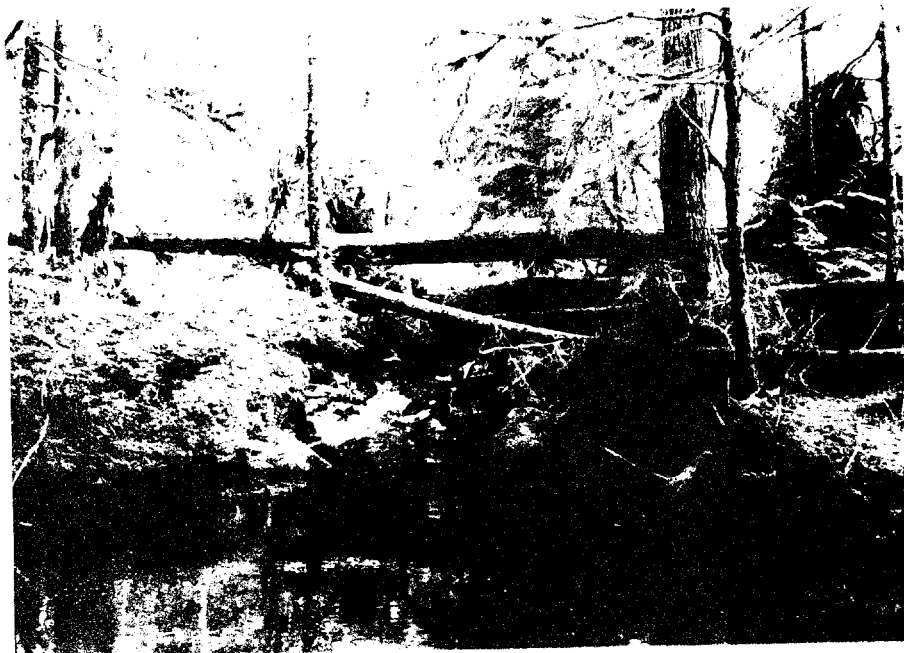
23. Investigators Gerry Merrigan 24. Date 5/11/83



East Headwater  
Salmon Bay Lake  
106-41-05



1. Mouth of stream with backwater area from lake.  
Blowdown visible left side.



2. 2.0 m cascade over bedrock with debris jam at top  
of cascade. Section 2: 68 m.

106-41-05

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	500	4.5	20	450.0					
2	138	3.5	10	48.3					
Total				498.3m <sup>2</sup>					

## LEVEL TWO HABITAT SURVEY

Part IV.

East Headwater

1. Stream Name Salmon Bay Lake

2. ADF&G Catalog No. 106-41-05

Reach Number							
1.	Section Number	1	2				
2.	Section Length	500	138				
3.	Compass Bearing	21	241				
4.	Gradient	0.5	0.5				
5.	Water Quality	3	3				
6.	Bank Type	B	B				
7.	Bank Stability	2(2)	1(1)				
8.	Bank Vegetation	1-5	1,3,5				
9.	Debris Loading	30	10				
10.	Undercut Bank Length	90m	20m				
11.	Stream Width:						
	Channel	4.5	9.8				
	Water	4.5	3.5				
12.	Water Type %: SS	60	10				
	DS	20	15				
	SF	20	55				
	DF	--	20				
13.	Substrate %:						
	Bedrock	15	20				
	Boulder	3	5				
	Large Cobble	15	20				
	Small Cobble	20	30				
	Gravel	30	20				
	Sand	7	3				
	Muck	--	--				
	Other	B10	B2				
14.	ASA %/Quality	20/2	10/2				
15.	Rearing Area %	50	15				
16.	Pool Cover %	35	3				
17.	Riffle Cover %	20	20				
18.	Fish Observed	CT	--				
19.	Sampling	Y	Y				
20.	Potential Barriers	N	Y				
21.	Enhancement/Rehab						

Section 1: 0m; Begin at lake. Mouth of stream is backwater of lake. Heavy blowdown and clay banks on left side. Deer sign.

40m; End backwater, begin flow. Debris/blowdown jam.

68m; Two discontinuous streams; channels through gravel.

93m; Channels unite. Low flow. Forbs in streambed.

190m; Highly sinuous and braiding. Good cover. ASA improving.

300m; Bedrock outcrops.

338m; Banks steepening. Substrate size increasing. Gradient decreasing.

22. Investigators Gerry Merrigan

Date 5/11/83



## LEVEL TWO HABITAT SURVEY

- Section 1: 447m; Heavy blowdown right side. Low flow; forbs in stream.
- Section 2: 18m; Tributary left side (approximately 1 cfs) from beaver dam,  
2.0 m in height.  
68m; 2.0 m cascade over bedrock with debris jam at top.  
138m; Stream braids into three small (less than 1.0 m) streams  
with low flow and velocity. Forbs in stream.

End of Survey.

## FISH SAMPLING FORM

East Headwater  
Stream Name Salmon Bay Lake ADF&G Catalog No. 106-41-05 Date 5/11/83  
Identify Survey Area A Water Temp. 7°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1530	1640	--	--	Section 1: 93 m left side
2	1600	1630	--	--	Section 2: 5 m

This form is used to record fish caught during Level Three, Four, or Five Surveys.

## LEVEL TWO HABITAT SURVEY

### Part I.

1. Survey Areas "A" Main Stem only 2. Section Length 500 m  
 3. Historical Fish Species RS, SS, ST (See "Escapement Record")

### Part II.

1. Stream Name South headwater Salmon Bay Lake 2. ADF&G Catalog No. 106-41-12  
 3. Latitude 56°13'00" Longitude 133°11'40"  
 4. Agency Unit 05 5. Mgmt. Area 534 K 6. USGS Map No. Petersburg A-4  
 7. Aerial Photo No. 1979 Photo FL LN 21 Roll 679 Photo 171  
 8. Bay/Drainage Salmon Bay Lake 9. Access 1 (Road at headwater)  
 10. Present Land Use Recreational  
 11. Historical Land Use Logging approximately 10 years old in upper headwaters of stream.  
 12. Stream Origin 3, 5, 6 13. Estimated Flow approx. 10 cfs 14. Flow Stage 2  
 15. Stream Temperature 8° 16. pH 7.5 17. Beaver Yes  
 18. Temperature Sensitivity Stream is shallow and slow in Section 1.  
 19. Barrier No 20. Weather 6

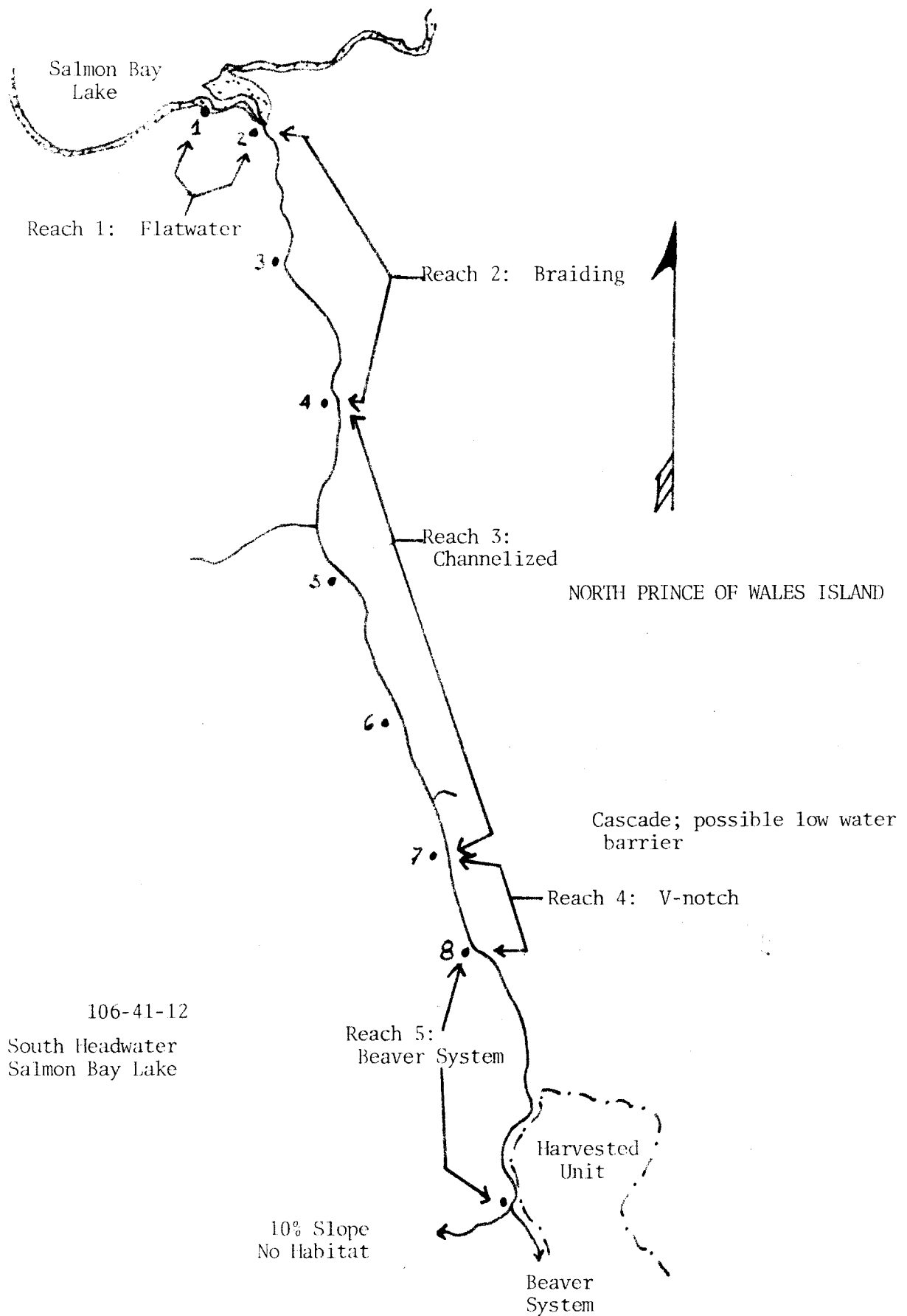
### Part III.

21. Intertidal - None, lake system.  
 A. Substrate: Fines --% Gravel/S. Cob. --%  
     L. Cob/Boulder/Bedrock --%  
 B. Gradient --%  
 C. ASA % --  
 D. Schooling --  
 E. Shellfish --  
 F. Anchorage --

### 22. Comments

Primarily significant as a sockeye stream, this major inlet to Salmon Bay Lake has its best habitat in the first 1500 m. Afterwards the stream contains poor habitat in the forms of a V-notch, beaver impoundments, and a harvested unit. Bear, deer, beaver and mink sign observed.

23. Investigators Gerry Merrigan & Randy Ericksen 24. Date 5/10/83



South Headwater  
Salmon Bay Lake  
106-41-12

REACH ANALYSIS

Reach 1

This 115 m section of stream is typified as a backwater interface between lake and stream. The length of stream affected would vary with changing lake level heights. Water temperature in this reach was 12°C due to low velocity and gradient. The substrate is largely gravel suitable for spawning but with heavy interstitial fines and low velocity flow. The ASA is of poor quality; however, rearing habitat is good with moderate amounts of coho fry present.

Reach 2

Beginning where the flatwater lake influence ends, this 1000 m reach exhibits considerable braiding and channel migration with debris jams. Stream flow is over a gentle gradient. The substrate is primarily gravel/small cobble. Silver salmon fry were observed in moderate amounts.

Reach 3

Characterized by steepening banks, increasing gradients, and substrate size, this reach of 1405 m possesses poor rearing and spawning habitat. Braiding and multiple channels end as stream becomes a channelized riffle flowing through steep banks.

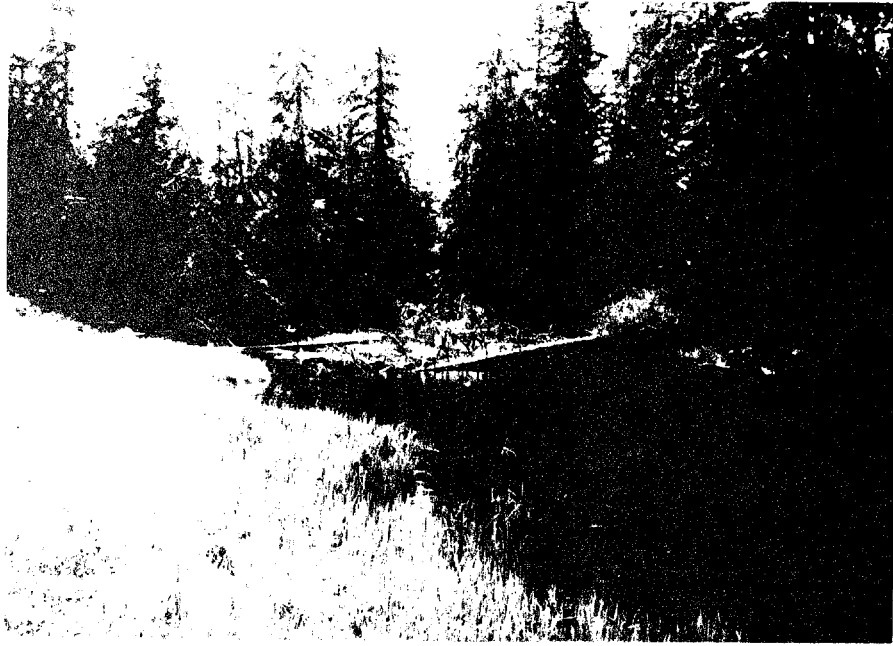
Reach 4

This reach begins with a 10 m cascade at 12% gradient with a 1.75 m falls at the top; a possible barrier at low water levels. Coho fry were observed above the cascade.

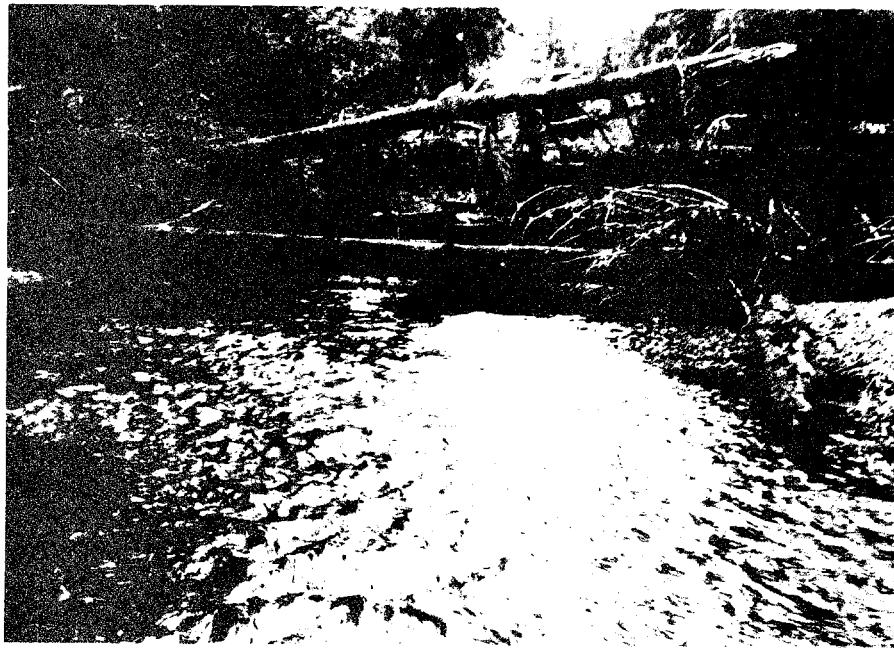
Reach 5

The stream now becomes an intermittent beaver system with occasional stretches of flowing water. The upper end of the reach enters an old (approximately 10 years) logging unit. At this point, there is a blown out, inactive beaver dam with heavy debris and fines behind it. The stream forks here with the left fork continuing into a beaver system within the unit. The right fork heads up the side slope at a 10% gradient over large cobble. End of survey.

Salmon Bay Lake  
106-41-12



1. Mouth of stream with backwater lake influence of Salmon Bay Lake.



2. Reach 2 habitat with spawning riffle below windthrow/debris jam.

Salmon Bay Lake  
106-41-12

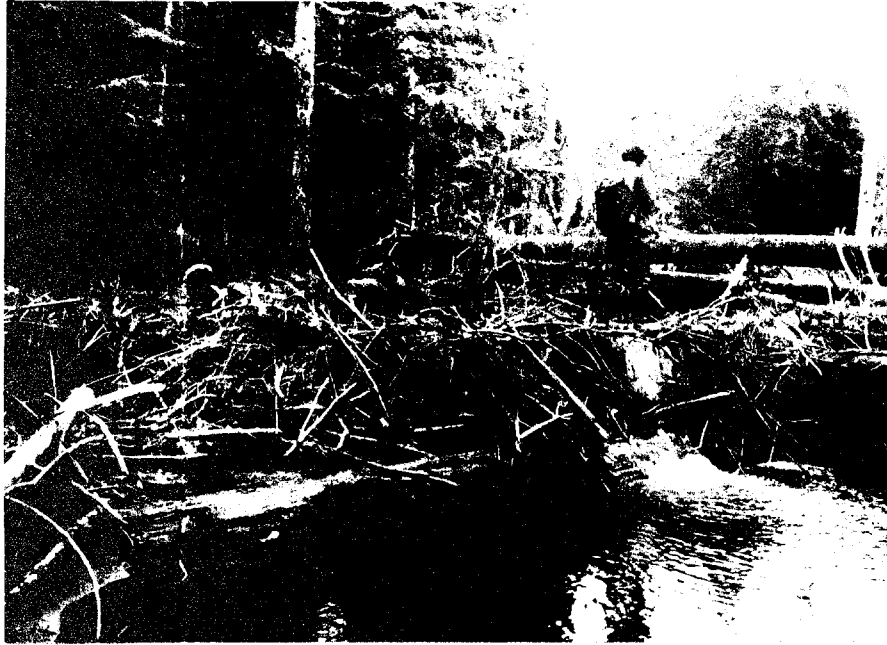


3. Reach 3 habitat with stream flow channelized between steep banks over cobble substrate.



4. Reach 4; Section 7; 0m - 1.75 falls and cascade. Possible low water barrier.

Salmon Bay Lake  
106-41-12



5. Reach 5; beaver dam.



South Headwater  
 Salmon Bay Lake  
 106-41-12

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
1	115	30.0	30	1,035					
2	500	8.1	35	1,417.5					
3	500	4.0	40	800					
4	500	9.0	25	1,125					
5	500	9.7	2	97					
6	405	4.7	0	0					
7	220	2.0	5	22					
8	390	25.0	5	487.5					

Total 4,984m<sup>2</sup>

# LEVEL TWO HABITAT SURVEY

Part IV. South Headwater

1. Stream Name Salmon Bay Lake 2. ADF&G Catalog No. 106-41-12

Reach Number	1	2	2	3	3	3	4
1. Section Number	1	2	3	4	5	6	7
2. Section Length	115	500	500	500	500	405	220
3. Compass Bearing	150	145		180	135	145	170
4. Gradient	0.5	0.5	0.5	1.0	1.0	1.0	1.5
5. Water Quality	3	3	3	3	3	3	3
6. Bank Type	A	A	A	B	B	B	B
7. Bank Stability	1(1)	1(1)	1(1)	1(1)	1(1)	1(1)	1(3)
8. Bank Vegetation	1,3,5	1,2,3	1,2,3	1,3	1,2,3	1,2,3	1,3
9. Debris Loading	5	10	10	3	3	2	20
10. Undercut Bank Length	125	200	90	40	35	10	10
11. Stream Width:							
Channel	30.0	18.0	7.0	11.0	12.5	10.2	2.0
Water	30.0	8.1	4.0	9.0	9.7	4.7	2.0
12. Water Type %: SS	50	30	25	10	5	5	10
DS	50	10	5	--	--	--	--
SF	--	60	70	90	95	95	90
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	--	--	--	5	10	25	30
Boulder	--	--	5	10	15	20	20
Large Cobble	--	--	15	20	23	20	25
Small Cobble	25	30	30	25	20	18	15
Gravel	55	40	35	10	10	15	10
Sand	10	20	10	10	10	2	--
Muck	5	--	--	5	2	--	--
Other	C5	B10	B5	--	--	--	--
14. ASA %/Quality	30/2	35/3	40/3	25/3	2/3	--	5/2
15. Rearing Area %	100	33	30	20	15	5	4
16. Pool Cover %	25	15	15	5	5	2	2
17. Riffle Cover %	0	5	5	5	5	2	5
18. Fish Observed	ST III	SS	SS	SS	SS	SS	0
	(adult)						
	SS						
19. Sampling	Y	Y	Y	Y	N	Y	N
20. Potential Barriers	N	N	N	N	N	N	Y2
21. Enhancement/Rehab							

Section 1: 0m; Begin flatwater caused by backwater lake influence. Water temperature, 12°. Beaver sign. Heavily undercut banks.

115m; End flatwater, begin streamflow.

Section 2: 287m; Tributary left side from beaver system.

366m; Debris dam and braiding.

398m; Debris jam and braiding.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/10/83

LEVEL TWO HABITAT SURVEY

South Headwater  
Salmon Bay Lake  
106-41-12

- Section 3: 75m; Braiding and debris jams.  
156m; Beaver pond left side, 30 m distant from left bank.
- Section 4: 0m; Increasing gradient and substrate size. Banks steepening  
and stream course becoming more channelized and less braided.  
325m; Tributary right side. Less than 1 cfs. Steep, with no  
habitat.  
470m; Tributary right side. No significant habitat.
- Section 6: 290m; Isolated bedrock patches.  
405m; Begin cascade.
- Section 7: 0m; Cascade from 10 m at 12% gradient with 1.75 falls at top  
of cascade, with no landing pool. Possible barrier at low  
water, though coho fry were observed above falls. Begin  
bedrock V-notch.  
220m; Beaver dam.

# LEVEL TWO HABITAT SURVEY

Part IV.

South Headwater

1. Stream Name Salmon Bay Lake

2. ADF&G Catalog No. 106-41-12

Reach Number	5						
1. Section Number	8						
2. Section Length	390						
3. Compass Bearing	145						
4. Gradient	0.5						
5. Water Quality	3						
6. Bank Type	A						
7. Bank Stability	1(1)						
8. Bank Vegetation	1,3						
9. Debris Loading	7						
10. Undercut Bank Length	120						
11. Stream Width:							
Channel	25.0						
Water	25.0						
12. Water Type %:							
SS	25						
DS	50						
SF	25						
DF	--						
13. Substrate %:							
Bedrock	--						
Boulder	--						
Large Cobble	--						
Small Cobble	10						
Gravel	20						
Sand	10						
Muck	60						
Other	--						
14. ASA %/Quality	5/2						
15. Rearing Area %	75						
16. Pool Cover %	20						
17. Riffle Cover %	1						
18. Fish Observed	SS						
19. Sampling	Y						
20. Potential Barriers	Y4						
21. Enhancement/Rehab							

Section 8: 0m; Beaver pond. Fry observed above dam.

170m; End pond. Resume flow.

185m; Beaver dam. Begin pond.

300m; End pond. Resume flow.

384m; Broken, blown out inactive beaver dam; heavy concentrations of debris/fines behind dam. Begin ~10 yr. old harvested unit both banks.

390m; Stream forks; left fork enters beaver pond system within unit; right fork heads up sideslope @ 10% gradient over large cobble.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/10/83

## FISH SAMPLING FORM

Stream Name South Headwater  
Salmon Bay Lake ADF&G Catalog No. 106-41-12 Date 5/10/83  
Identify Survey Area A Water Temp. 8°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1255	1941	SB - 3	--	Section 1: 30m (water temperature 12°C)
2	1350	1938	--	--	Section 2: 0m
3	1455	1925	SS - 4	--	Section 3
4	1500	1700	--	--	Section 4: 325m
5	1705	1840	--	--	Section 6: 250m
6	1750	1830	SS - 1	--	Section 8: 125m

This form is used to record fish caught during Level Three, Four, or Five Surveys.

South Headwater  
Salmon Bay Lake

South Headwater  
Salmon Bay Lake

## LEVEL TWO HABITAT SURVEY

### Part I.

A (Main Stem)  
 1. Survey Areas B, C (Tributaries) 2. Section Length about 500 m  
 3. Historical Fish Species RS

### Part II.

West Headwater  
 1. Stream Name Salmon Bay Lake 2. ADF&G Catalog No. 106-41-15  
 3. Latitude 56°13'10" Longitude 133°12'10"  
 4. Agency Unit 05 5. Mgmt. Area 534 K 6. USGS Map No. Petersburg A-4  
 7. Aerial Photo No. 1981 Photo Fl. Ln. 20 Photos 157-159  
 8. Bay/Drainage Salmon Bay Lake 9. Access 2  
 10. Present Land Use recreational  
 11. Historical Land Use remnants of fish camp at stream mouth  
 12. Stream Origin 3, 4, 5, 6 13. Estimated Flow 12 cfs 14. Flow Stage 2  
 15. Stream Temperature 7°C 16. pH 7.7 17. Beaver yes  
 18. Temperature Sensitivity yes, only in first 300 m as gradient 0.5%  
 19. Barrier yes (backwater from lake) 20. Weather 2

### Part III.

21. Intertidal - none

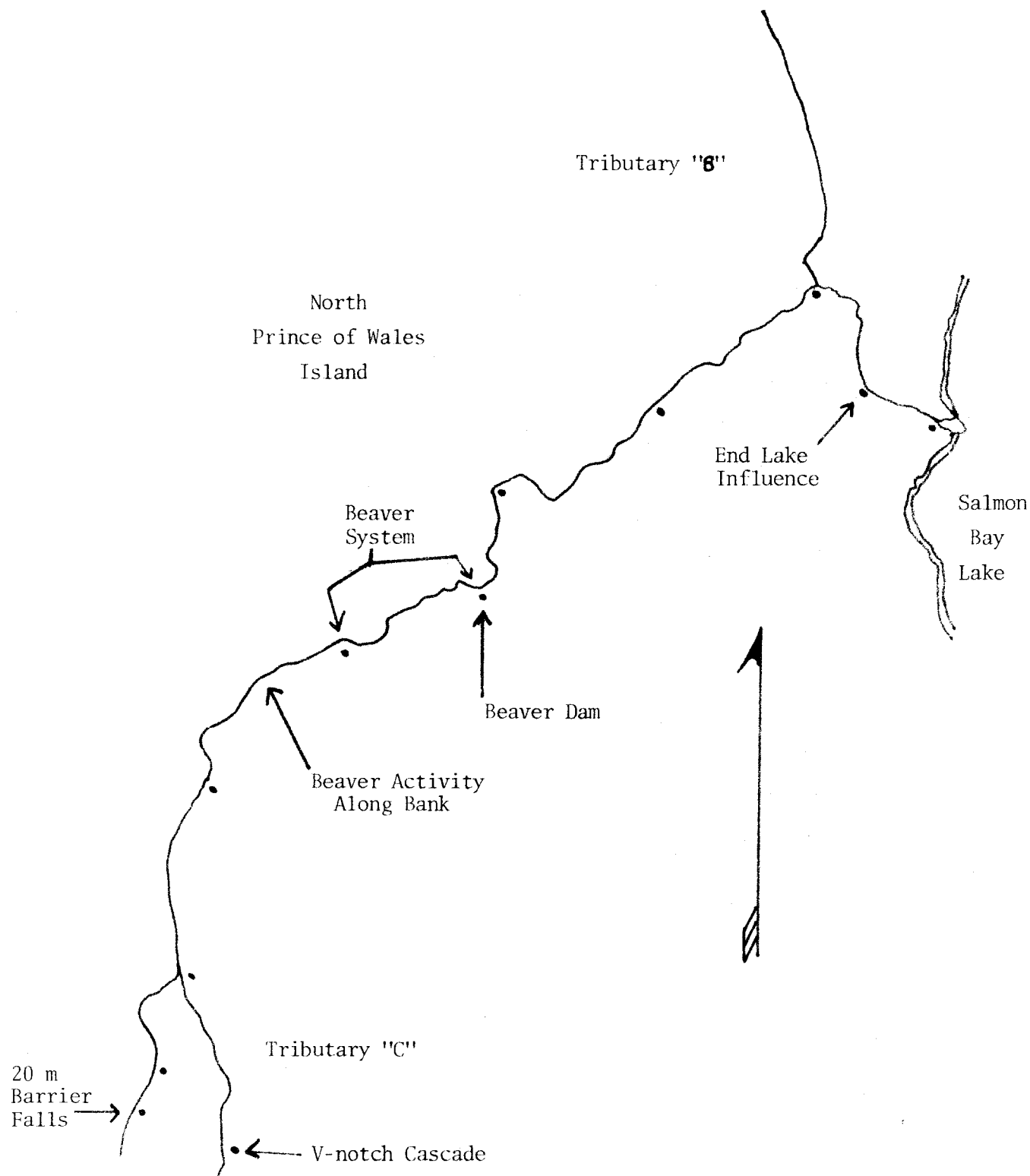
A. Substrate: Fines        % Gravel/S. Cob.        %  
                   L. Cob/Boulder/Bedrock        %  
 B. Gradient        %  
 C. ASA %         
 D. Schooling         
 E. Shellfish         
 F. Anchorage       

22. Comments

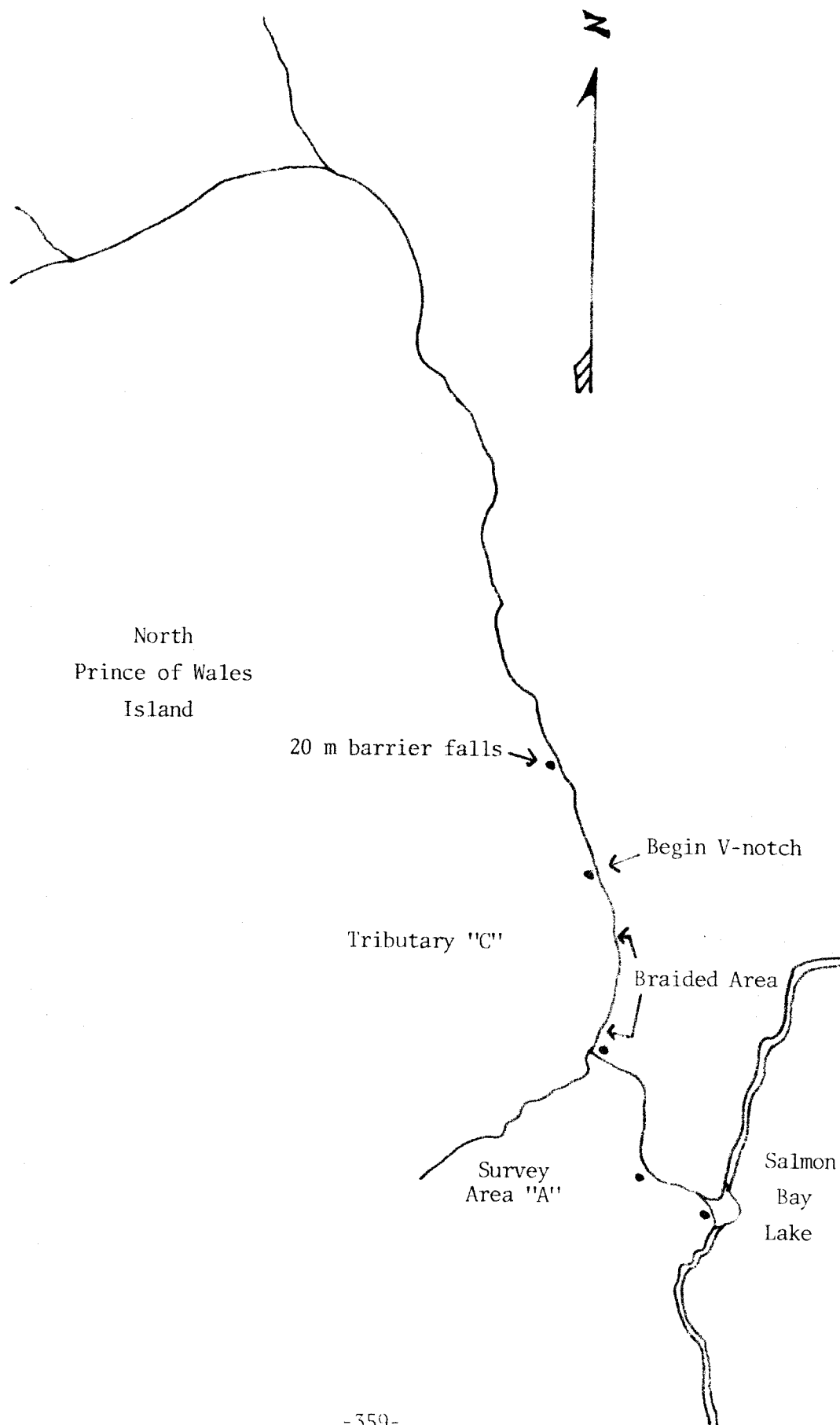
#### Stream Evaluation

This inlet stream is a major component of the Salmon Bay Lake system. Primarily significant for red salmon, the stream is also significant for coho, steelhead, pinks and trout. The best habitat is located in the lower reaches of the stream (Area "A": Sections 1-5, 8, 9 and Area "B": Section 1) with the upper reaches steepening quickly and terminating available habitat with beaver falls.

23. Investigators Gerry Merrigan & Randy Ericksen 24. Date 5/11/83







## Survey Area "A"

### REACH ANALYSIS

#### Reach 1

The initial reach (300 m) is characterized by the backwater influence of Salmon Bay Lake as evidenced by the low gradient and resulting low velocity throughout the reach. The extent of this flatwater influence would vary with lake water levels. The substrate is largely loose gravel providing excellent spawning habitat, especially for sockeye due to the lower level of aeration. This reach is possibly temperature sensitive for the same reasons: low gradient, low velocity and shallow water depth.

Continuous undercut banks, along with moderate amounts of cross-stream windthrow, create good rearing habitat. Abundant coho fry were observed as well as eleven adult steelhead.

#### Reach 2

Increased velocity and gradient provide an excellent pool/riffle ratio (1:1) over loose small cobble/gravel substrate. In short, this reach (390 m) has good ASA and rearing habitat. The confluence of Tributary "B" (about 4 cfs of 35% of the total flow) marks the end of the reach.

#### Reach 3

Beginning at the confluence of Tributary B, this main stem reach is (1110 m) is predominantly low gradient with excellent rearing habitat and fair to good ASA. However interspersed are patches of bedrock and moderate gradient. Coho fry were common throughout the reach.

#### Reach 4

Consisting of a large beaver system, this reach (290 m) consists of only rearing habitat with no ASA.

#### Reach 5

Generally of low gradient, this reach (1320 m) is characterized by moderate ASA and good pool/riffle ratio.

## Survey Area "B"

Tributary entering Section 3: 0m of Survey Area "A": Main stem:

#### Reach 1:

The reach of this tributary (about 4 cfs) exhibits relative instability as evidenced by considerable braiding, multiple channels, channel migration,

## Survey Area "B"

### Reach 1 Cont.

excessively undercut banks and large numerous jams. Since the immediate upstream area (Reach 2) is a well channelized V-notch, it appears that occasional extreme peak floods roar out of Reach 2 at high velocity and consequently cause the apparent instability in Reach 1 (421 m).

Substrate is largely small cobble with size increasing upstream within the reach. Rearing and spawning habitat is good yet unstable due to the shifting stream course. Coho fry were observed in moderate amounts throughout the reach.

### Reach 2:

The multiple channels of the previous reach end as the stream enters a V-notch with increasing substrate size (large cobble and boulder) and gradient. Accordingly, poor spawning and rearing habitat is available here. No fish were observed in this V-notch.

The reach ends with a 20 m barrier falls over bedrock. Reconnaissance above the falls found habitat unsuitable for the possibility of enhancement.

## Survey Area "C"

Tributary entering main stem at Section 8: 480 m of Survey Area "A":

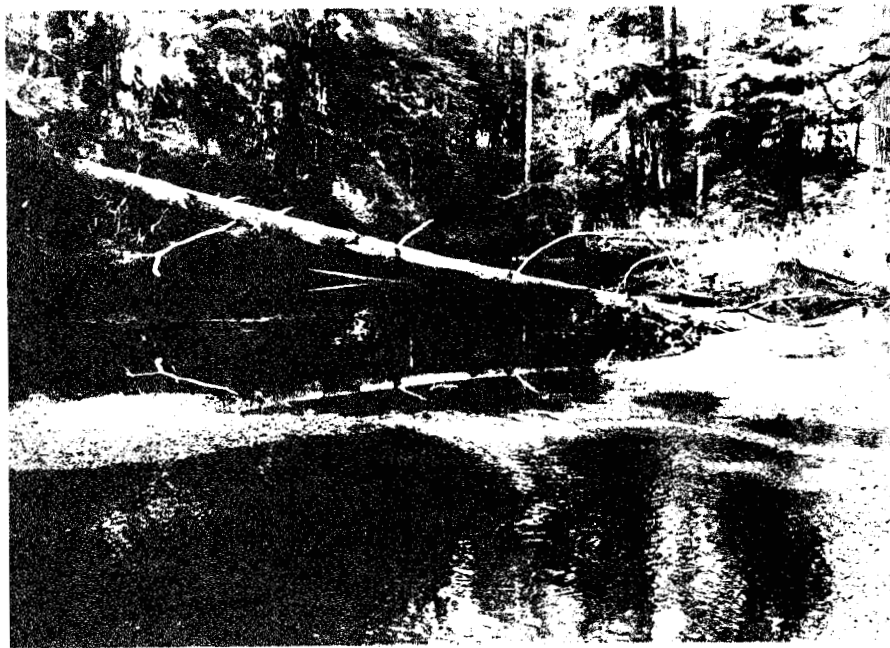
### Reach 3:

Tributary "C" is generally poor fish habitat with steep gradient, large substrate size and consequently few fish.

West Headwater  
Salmon Bay Lake  
106-41-15



1. Mouth of stream showing backwater influence of a lake;  
characteristic of Reach 1.



2. Beginning of Section 3 just above confluence of  
Tributary "B".

West Headwater  
Salmon Bay Lake  
106-41-15



3. Section 5: Showing excellent pool/riffle ratio.

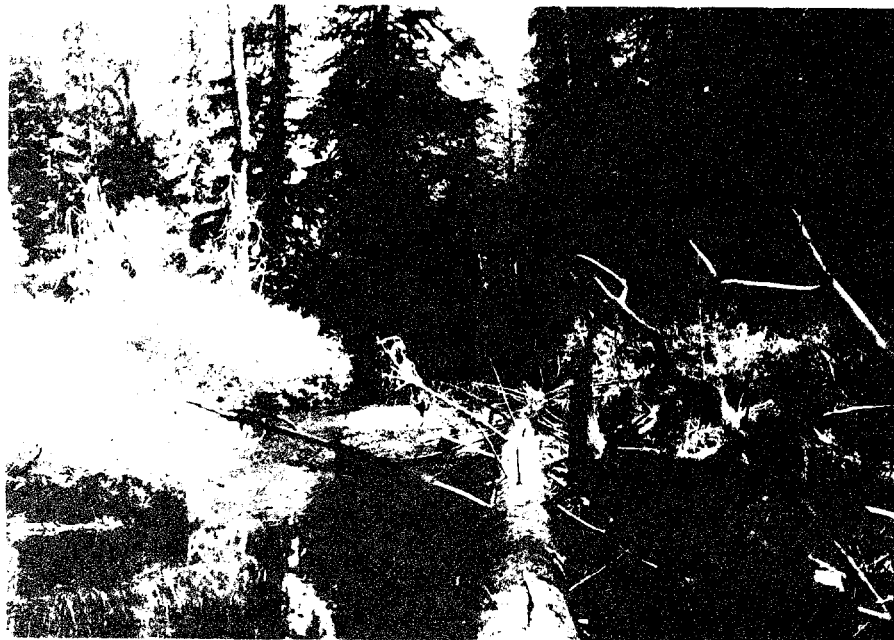


4. Beaver dam at beginning of Section 6.

West Headwater  
Lumber Bay Lake  
10-10-15

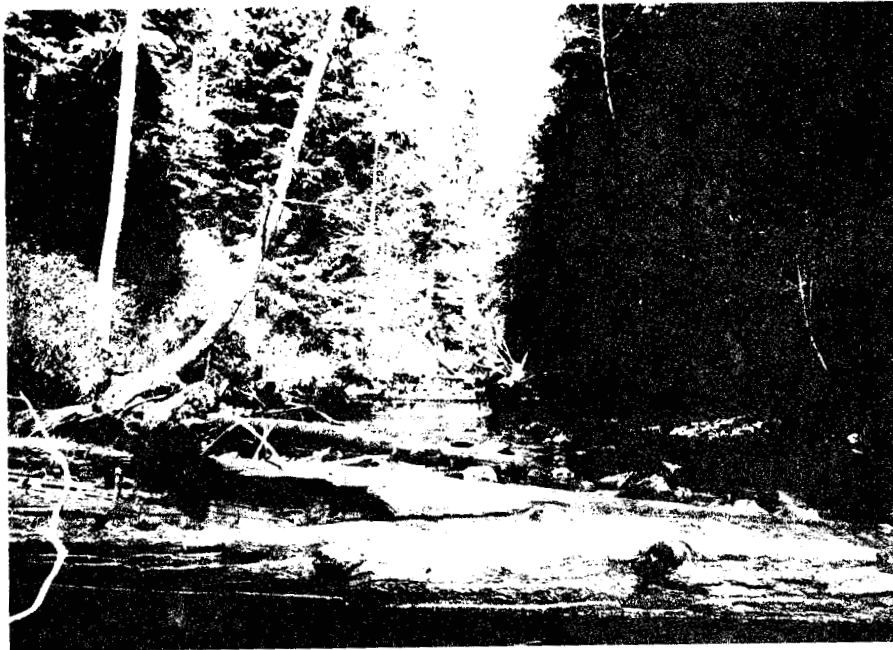


5. 20 m barrier falls at the end of Section 10. Terminate main stem survey.



6. Mouth of Tributary "B" at Section 2: 390 m of main stem.

West Headwater  
Salmon Bay Lake  
106-41-15



7. Transition from braided stream (Reach 1) to  
V-notch (Reach 1) on Tributary "B": Section 2;  
0 m.



8. 20m; barrier falls, Tributary "B": Reach 2:  
Section 2; 241 m.

East Headwater  
Salmon Bay Lake  
106-41-15



9. V-notch, cascade at end of Section 1: Tributary "C".



West Headwater Salmon Bay Creek  
106-41-15

Section	Length (m)	Width (m)	ASA %	ASA Total	Section	Length (m)	Width (m)	ASA %	ASA Total
Survey Area "A"									
1	300	26.0	70	5460					
2	390	9.0	30	1053					
3	400	9.5	5	190					
4	500	10.4	30	1560					
5	210	13.6	10	285.6					
6	290	--	--	--					
7	500	8.7	10	435					
8	480	8.8	10	422.4					
9	270	3.3	40	356.4					
10	70	4.8	--	--					
Total				8814.7m <sup>2</sup>					
Survey Area "B"									
1	421	7.0	30	416.8					
2	241	4.8	5	84.4					
Total				501.2m <sup>2</sup>					
Survey Area "C"									
1	410	4.8	--	--					
Total Areas A, B, & C:				9315.9m <sup>2</sup>					

# LEVEL TWO HABITAT SURVEY

## Part IV.

West Headwater

1. Stream Name Salmon Bay Lake 2. ADF&G Catalog No. 106-41-015

Survey Area "A": Main Stem

Reach Number	1	2	3	3	3	4	5
1. Section Number	1	2	3	4	5	6	7
2. Section Length	300	390	400	500	210	290	500
3. Compass Bearing	272	350	280	205	135	--	320
4. Gradient	<0.5	0.5	1.5	1.0	1.0	0.5	1.0
5. Water Quality	3	3	3	3	3	3	3
6. Bank Type	A	A	B	A	A	A	D
7. Bank Stability	1(1)	1(1)	--	--	3(3)	--	--
8. Bank Vegetation	1-3,5	1,3-5	1-5	1,3	1,4	1-5	1,3,4
9. Debris Loading	15	15	3	2	3	4	4
10. Undercut Bank Length	370	325	50	10	5	--	--
11. Stream Width:							
Channel	26.0	20.5	17.3	14.1	14.0	--	13.4
Water	26.0	9.0	9.5	10.4	13.6	--	8.7
12. Water Type %: SS	60	20	20	30	30	40	40
DS	40	30	5	10	10	50	10
SF	--	50	75	60	60	10	50
DF	--	--	--	--	--	--	--
13. Substrate %:							
Bedrock	--	1	30	10	5	--	--
Boulder	--	--	10	5	5	10	--
Large Cobble	5	10	10	20	15	--	5
Small Cobble	20	30	25	25	25	20	10
Gravel	60	50	20	20	30	20	50
Sand	10	4	5	10	15	20	25
Muck	--	--	--	--	5	30	10
Other	B5	B5	--	--	--	--	--
14. ASA %/Quality	70/3	30/3	5/2	30/2	10/2	--	10/2
15. Rearing Area %	100	50	25	40	60	70	50
16. Pool Cover %	15	20	2	5	2	20	3
17. Riffle Cover %	--	10	3	5	3	--	2
18. Fish Observed	ST - 2	SS	SS	SS	SS	SS	SS
	(adult)		ST				
	SS		CT				
19. Sampling	N	Y	Y	N	N	Y	N
20. Potential Barriers	N	N	N	N	N	N	N
21. Enhancement/Rehab	N	N	N	N	N	N	N

Section 3: 240m; Tributary right side with no fish habitat; this section has low gradient and large areas of bedrock with thick moss cover.

Section 4: Good ASA and rearing habitat in this section with abundant coho fry throughout. A 30 m stretch of 4% gradient begins at 200 m.

Section 5: 190m; Blue clay banks. Beaver and otter sign prevalent throughout section. Excellent pool/riffle ratio.

Section 6: Beaver pond system with rearing habitat only.

Section 7: Continued low gradient/fair ASA. Beaver activity along left bank.

22. Investigators Randy Ericksen & Gerry Merrigan Date 5/11/83

# LEVEL TWO HABITAT SURVEY

Part IV.

West Headwater

1. Stream Name Salmon Bay Lake

2. ADF&G Catalog No. 106-41-15

Area "A"

Area "B"

Area "C"

Reach Number	5	5	5	1	2	1	
1. Section Number	8	9	10	1	2	1	
2. Section Length	480	270	70	421	241	410	
3. Compass Bearing	180	100	--	370	330	170	
4. Gradient	1.5	0.5	6.0	1.5	3.0	5.0	
5. Water Quality	3	3	3	1	1	3	
6. Bank Type	A	B	B	A	B	B	
7. Bank Stability	--	--	--	2(1)	1(3)	--	
8. Bank Vegetation	1-5	1,3,4	1,3	1,2,3	1,2,3	1,3-5	
9. Debris Loading	4	3	4	20	5	10	
10. Undercut Bank Length	--	20	--	205	--	5	
11. Stream Width:							
Channel	11.7	4.3	9.0	11.3	10.1	7.4	
Water	8.8	3.3	4.8	3.3	7.0	4.8	
12. Water Type %:							
SS	35	10	40	40	20	15	
DS	5	--	--	20	20	5	
SF	60	90	60	40	40	80	
DF	--	--	--	--	20	--	
13. Substrate %:							
Bedrock	--	--	23	1	15	10	
Boulder	--	20	22	--	15	20	
Large Cobble	5	10	23	15	35	30	
Small Cobble	15	10	22	40	20	20	
Gravel	60	50	10	30	10	10	
Sand	15	5	--	5	3	5	
Muck	5	5	--	--	--		
Other	--	--	--	B9	B2	--	
14. ASA %/Quality	10/2	40/2	--	30/3	5/2	--	
15. Rearing Area %	40	30	40	50	15	40	
16. Pool Cover %	4	5	5	50	2	10	
17. Riffle Cover %	1	4	4	30	2	3	
18. Fish Observed	SS	SS	--	SS	--	SS	
		ST					
19. Sampling	N	Y	N	Y	N	Y	
20. Potential Barriers	N	N	Y/2	N	Y/2	Y/2	
21. Enhancement/Rehab	N	N	N	N	N	N	

Section 8: Ends at confluence of Tributary "C".

Section 9: Good ASA with slight increase in substrate size. Trout and coho fry abundant.

Section 10: Steep gradient with poor habitat.

20m; Barrier falls. Survey Area "A" end.

22. Investigators Gerry Merrigan & Randy Ericksen Date 5/11/83

## LEVEL TWO HABITAT SURVEY

### Survey Area "B"

Section 2: 241m; 20m barrier falls. Reconnaissance above falls found continued barriers and cascades over bedrock at 12% and increasing gradient.

### Survey Area "C"

Section 1: Tributary flows through steep V-notch. No fish observed above 2.0 m falls.

## FISH SAMPLING FORM

West Headwater  
Stream Name Salmon Bay Lake ADF&G Catalog No. 106-41-015 Date 5/11/83

Identify Survey Area as indicated Water Temp. 7°C Bait Used Liverwort

Trap	Time In	Time Out	Species	Length	Comments
1	1030	1500	--	--	Area "A", Reach 2; Section 2: 5 m of main stem
2	1040	1550	SS - 1 ST - 1		Area "A", Reach 3; Section 3: trench pool
3	1155	1530	SS - 1		Area "A", Reach 3; Section 6: beaver pond
4	1420	1455	--		Area "A", Reach 5; Section 9: glide*
5	1130	1300	--		Area "B", Reach 1; Section 1: 33 m.
6	1330	1400	--		Area "C", Section 13; Side channel. SS fry observed near trap.

This form is used to record fish caught during Level Three, Four, or Five Surveys.

\*A ST fry was feeding on bait through mesh and prevented other ST and SS fry from entering trap.

PEAK ESCAPEMENT RECORD  
West Headwater Salmon Bay Creek  
106-41-15

DATE	PINK	CHUM	OTHER SPECIES SCKEYE	REMARKS
9/6/77			4,316	
9/5/78			815	
8/27/80			15,840	
8/18/82			300	

## APPENDIX A

### Level III Fisheries Surveys Handbook

## FISHERIES SURVEYS HANDBOOK

330 - Level Three is a field survey. It is designed to provide adequate baseline and summary information for management of unmanipulated habitats. It provides both measured and estimated information of individual parameters, as well as judgmental summaries on certain aspects of the stream environment. The emphasis is on efficient use of time so the fish habitat in areas where we anticipate low levels of land use, such as those of wilderness status or equivalent to land use designations I or II can be surveyed in a timely manner.

330.1 - Objective of Level Three is to meet management needs for streams not proposed for manipulation by major land use activities or where time factors and priorities do not allow more intensive surveys. The survey is designed to be accomplished quickly and efficiently with a minimum of equipment and field time yet still provide baseline information about the fisheries habitat, potential high-risk areas to development and identification of possible enhancement sites.

330.2 - Standards of Level Three are at a minimum for quantitative data and a maximum for qualitative data.

Specific standards for the procedure to accomplish Level Three are listed below. These standards should be interpreted to mean that at the minimum, data collected in the survey shall be at least as accurate as specified, and at least all the parameters listed should be included.

1. Major types of streamside vegetation and fish species in the stream will be collected and identified visually to species by a knowledgeable observer.
2. Volume of streamflow will be measured with a method at least as reliable as the Embury Method.
3. Quantity of aquatic vegetation in the stream will be estimated visually.
4. The source of water, bank stability along the stream, stream bottom material, water turbidity, streamflow stage, water color, barriers to upstream migration, water impoundments, will be subjectively determined.
5. Quality and area of salmonid spawning gravel will be estimated subjectively.
6. Juvenile salmon rearing area, pool riffle ratio, and stream cover will be included.



7. Date and climatic conditions at time of survey will be included.
8. Water and air temperature will be measured to nearest degree C.
9. pH will be measured to the nearest half unit.
10. Stream gradient will be measured to the nearest 1/2 percent.
11. Water width will be measured to the nearest 1/2 meter with a range finder or tape measure.
12. A system of photographs will be established for the stream.
13. A schematic map will be drawn for the stream.
14. A narrative describing sport fish potential, wildlife observations, land use influences, accessibility and enhancement potentials will be written.

330.3 - Equipment Needed

Level Three Survey Forms 2600-3a, 3b and 2600-5b  
Section 330.4 of the handbook reproduced on waterproof paper  
Field notebook  
Mechanical pencils  
Maps, USGS quads and aerial photographs  
50 Meters tape measure  
Abney level or clinometer  
Centigrade Thermometer  
Camera with film  
Compass  
Minnow traps (6) and bait  
Tricaine methanesulfonate  
Dip net  
Fish measuring ruler (metric)  
Range finder  
Pocket altimeter  
pH meter  
Scientific sampling permit

330.4 - Procedure. There are several phases of data collection for Level Three survey: preplanning before starting field work; field work broken down into data that is entered once for each survey area and date that is entered once at least every 100 meters along the stream; and office work to be done after the field work.

330.41 - Preplanning and data collection before starting field work includes the following: Make required entries once for every survey area on the first part of form 2600-3a (1/81).

1. Survey Areas      If a stream system has major tributaries entering the main stream, the survey can be divided into survey areas (at the discretion of the biologist conducting the survey). The main stream is designated as "A" and major tributaries as "B", "C", "D", etc., going upstream as tributaries enter the main stream. Before starting, the survey areas should be specified. Record yes or no if survey areas are used. If yes, specify by sketching a map on back of form and labeling areas.

2. Equipment      The field crew should double-check equipment to make sure everything is there and in working order. Date when check is made.

3. Historical Fish Species      If a Level Two survey hasn't been done for the stream, it will be necessary to check ADF&G escapement records to determine which species are known to occur in the stream. Enter appropriate code from the key. Other information relative to Level Two survey should be accumulated whenever you come across it.

KS - king salmon	DV - Dolly Varden
SS - silver salmon	RT - rainbow trout
RS - red salmon	CT - cutthroat trout
CS - chum salmon	SM - smelt
PS - pink salmon	ST - steelhead
NP - northern pike	BT - brook trout
CO - cottids	GR - grayling
LT - lake trout	WH - whitefish
SB - stickleback	BU - burbot
	OT - other

4. Section Length      Various items of data are collected at 100 meter intervals or less (at the discretion of the biologist conducting the survey) along the entire survey area. Record here the length of sections used in the survey.

330.42 - Data entered once per survey area. The following items should be recorded on the second part of form 2600-3a (1/81) while at the stream once for each survey area.

<u>Item</u>	<u>Explanation</u>
1. Stream Name	a. Record the stream name as listed on the map or as commonly known.  b. Identify survey area if designated.
2. ADF&G Catalog No.	Enter appropriate State Fish and Game Catalog number for stream surveyed.
3. Latitude and Longitude	Record the latitude and longitude to the nearest five seconds for the lower end of the survey area. Use appropriate geodetic scale to interpolate precise latitude and longitude off a USGS quad.
4. Agency Unit	Enter the appropriate land area code as assigned to each agency.  02 Stikine      10-19 BLM 03 Chatham     20-29 National Park 04 Chugach     30-39 State Park System 05 Ketchikan   40-49 F&WS 50-69 Native Corporations
5. Management Area	Enter the appropriate agency subunit code. (List of management area codes to be developed and distributed by each agency).
6. USGS Map Number	Identify number of USGS Quadrangle containing the system.
7. Aerial Photo Number	If an aerial photo is used, record the flight line, roll, photo, year and grid.
8. Bay/Drainage	Include complete name of drainage system or bay containing the stream.

9. Access Enter up to two codes from this list:
- 1-satisfactory for modern car
  - 2-appropriate for pick-up
  - 3-appropriate for 4-wheel drive
  - 4-available by boat
  - 5-available by air
  - 6-trail for horse or foot
  - 7-no trail to area (undeveloped).
10. Camping Facilities Enter appropriate code which may influence use on this part of the stream. "Private Organization" would include both those provided by State and Federal organizations.
- 1-private organization (lodge or motel)
  - 2-government campground
  - 3-public cabin (Gov't owned cabins rented to public)
  - 4-undeveloped.
11. Present Land Use
- a. Note any activities associated with man's present use or planned use such as logging, mining, roads, dumpsites, etc.
  - b. Note any game or human trails and the amount of brush interference while surveying.
12. Historical Land Use Note any evidence of historical land use such as logging (and approximate year), mining, abandoned cannery sites, etc.
13. Stream Origin Enter appropriate codes describing source of water at that point on the stream. If other is specified note source in comments.
- 1-lake
  - 2-glacial
  - 3-groundwater
  - 4-muskeg
  - 5-surface runoff
  - 6-subsurface runoff
  - 7-other
14. Flow Stage Enter best estimate as to flow at time of survey. (See glossary for diagram of terms). 1-low 2-normal 3-high.

15. Flow Measurement      Measure with flow meter or Embody Method.  
(See glossary for explanation of Embody Method). Take measurement where physical conditions are appropriate somewhere within one survey area. If the Embody is used, record "E", water width, depth, length, constant, time, and location where measurement is taken by using the aerial photo grid number (form 2600-5a). If a flow meter is used, record "Y" and the amount to the nearest 1/10 cubic meter.
- If stream is too large to physically measure (i.e., you cannot stand in the stream) then estimate flow or get it from hydrological records. Indicate on the form if estimated or cite the records.
16. Temperature Sensitivity      Comment briefly as to whether the stream appears temperature sensitive based on whether it is an east-west oriented stream, influenced by muskeg or lake source, bedrock stream bottom, shallow water depth or low velocity.
17. Beaver      Enter appropriate code from key:  
1-active beaver dam  
2-inactive beaver dam, good repair  
3-inactive beaver dam, poor repair  
4-old dam, little effect on stream  
5-no beaver activity  
6-beaver activity but no dams
18. Type of Aquatic Vegetation      Enter appropriate code from key:  
1-mosses  
2-filamentous algae  
3-periphyton  
4-vascular plants
19. Density of Aquatic Vegetation      Enter appropriate code from key:  
1-dense (abundant vegetation on rocks or over the entire area)  
2-medium (1/2 of all rocks with vegetation)  
3-sparse (vegetation seldom observed).

20. Adult Salmonids      Mature salmon and trout are counted when in schools or when dispersed on the spawning gravels. Tabulate numbers by stream section in 330.43 No. 19. The presence of fish bones are very important where noted during the survey, especially for those streams with no past escapement record. Record yes or no if there were adult salmon.
21. Intertidal Zone      If there is an intertidal zone within the survey area take following data:
- a. Gradient in the intertidal zone measured with a clinometer or abney level. Record to nearest 1/2 percent.
  - b. Bottom type: estimate;
    - % fines (2mm or smaller)
    - % gravel/small cobble (2-128mm or up to 5 1/2")
    - % large cobble/boulders/bedrock (128mm+ or 5 1/2"+)
    - sum should equal 100%
  - c. Available spawning area: estimate quality as poor, fair, good or excellent.
  - d. Note yes or no whether schooling areas are present in the estuary or lower sections of the stream; if yes, describe in comments.
  - e. If survey coincides with low tide, note yes or no shellfish potential and if yes, describe in comments.
  - f. Describe known anchorages or ones used during the survey and their exposure.
22. Comments      Add any comments that are important to the aquatic resources, or required to answer other items on the list.
23. Investigators      Enter names of people doing the field work.
24. Date      Enter numerical designation for Month/Day/Year.
25. Time      Record military times of when field parts of survey start and end.

26. Weather Conditions Enter the appropriate code from the key. If there is an unusual situation, enter in comments.
- |           |         |                 |
|-----------|---------|-----------------|
| 1-rain    | 2-clear | 3-overcast      |
| 4-snowing | 5-fog   | 6-partly cloudy |

27. Photos At least one black and white print photo is required for every survey area and at every readily identifiable change in habitat type, unique situation, barrier falls, and the intertidal area. Photos should be taken facing upstream unless specifically noted in the photo records.

Since it is impossible to look back at several rolls of film and properly label them, prior identification is needed. Make a label with the date, stream name, survey area, and section number written on it and photograph it in the frame immediately proceeding the frames of the stream. In addition record each photo in a notebook. Number each roll with a number on the film canister before use. As an example, the first roll of film being used by Jim Boyle in 1979 would be labeled JD-79-1, the second JD-79-2, etc. Under this number in his notebook he would list each photo as it's being taken and identify date, stream name, survey area, and section number.

Record the roll number and how many photos were taken in the space on the form.

330.43 - Data Entered Once Every 100 Meters. The following items should be recorded on form R-10 2600-3b (1/81) while at the stream once for at least every 100 meter section of stream in the survey area. The form is designed to have one column filled in for each successive 100 meter section, identified by item 1, section number.

1. Section Number The stream is divided into sequential samples at least every 100 meters. Numbering should start at the furthest downstream point and increase consecutively upstream. Sections in the intertidal zone should be labeled with the code "I".

2. Compass Bearing  
Take magnetic compass reading of general direction of stream channel, shoot upstream, record to the nearest degree taking into consideration declination.
3. Gradient  
Measure gradient over the section being surveyed with a clinometer or abney level. Record to nearest 1/2 percent.
4. Temperature  
Record both air and water temperatures to the nearest degree centigrade at time of survey. Record temperature of tributaries entering this section under comments.
5. Water Quality  
Enter appropriate codes from key:
  - a. color: 1-clear      2-glacial  
             3-light tan   4-tan
  - b. turbidity, record how deep you can see:  
1-clear (no noticeable suspended material)  
2-slight (noticeable suspended materials, bottom features are easily discernable)  
3-turbid (suspended materials are not noticeable, bottom features are difficult or impossible to discern)
  - c. pH, record to nearest .5 increment using a universal wide-range color wheel or electronic pH meter. The pH should be taken above the intertidal zone.
6. Available Spawning
  - a. Percent ASA: record ASA as an estimated % of the stream area being surveyed.
  - b. Spawning Gravel Compactness: By feeling the gravel with your foot pressure estimate: 1-compact 2-moderate 3-loose
7. Water Width
  - a. Record active channel width to the nearest 1/10 meter. Active channel width is defined as to the edge of streamside vegetation.
  - b. Record water width (bankfull stage) to the nearest 1/10 meter. Width of multiple channels should be recorded separately.



c. Indicate whether a floodplain exists according to the key.

- 1 - no floodplain, stream always flows within channel banks
- 2 - small floodplain occurs, it is less than 5 X the active channel width
- 3 - large floodplain occurs, it is greater 5 X the active channel width

#### 8. Stream Pools

a. Estimate percent of stream containing pools. Pools are distinguishable areas of the stream where water velocities are less than 30 cm/sec.

b. Categorize majority of pools according to key as:

- SS - shallow (less than 50 cm deep), slow (less than 30cm/sec)
- SF - shallow (less than 50 cm deep), fast (greater than 30cm/sec)
- DS - deep (greater than 50 cm deep), slow (less than 30cm/sec)
- DF - deep (greater than 50 cm deep), fast (greater than 30cm/sec)

#### 9. Debris Loading

Estimate percent area covered by debris. Picture all the debris for that section piled up in one place and compute the % area it would cover.

#### 10. Potential Barriers

Enter yes or no if a fish migration barrier is present. If yes, record the type of barrier.

- |              |              |
|--------------|--------------|
| 1-velocity   | 4-beaver dam |
| 2-falls      | 5-manmade    |
| 3-debris jam | 6-other      |

Photograph the barrier.

11. Enhancement/  
Rehabilitation  
Opportunity
- If there is enhancement or rehabilitation potential in the sample being surveyed, complete an Enhancement/Rehabilitation Survey form. Enter yes or no whether one was done.
12. Upper Bank
- a. Record percent slope for left and right banks (facing upstream). Stand on outside edge of lower bank and shoot at least 30 meters up the upper bank. If you cannot cross the stream then estimate percent slope and indicate it is an estimation on the form.
- b. Indicate yes or no whether potential soil movement is indicated by pioneer vegetation, a V-notch or thin soil.
- c. Use codes yes or no to indicate whether vegetation is the primary factor contributing to stability.
13. Lower Bank Type
- Record lower bank type for left and right banks using key:  
GS-gently sloping (100%)  
SS-steeply sloping (100%-200%)  
U-undercut
14. Lower Bank
- Rating. Enter appropriate code from key left and right banks:
- 1-good stability--banks consist almost entirely (90%) of (1) soil with well-developed vegetation cover/root masses and/or (2) exposed soil with high proportion (65%) of rock material and/or (3) bedrock. No evidence of active erosion.
- 2-fair stability--banks consist of (1) 50% of bank cover with well-developed vegetation cover/root masses and/or (2) exposed soil with moderate proportion (40-65%) of rock and/or (3) 50% of the banks consist of bedrock. Evidence of some erosion within the last year exists.

- 3-poor stability--banks consist of (1) 50% of bank area with well-developed vegetation cover/root masses or (2) exposed soil with small proportion (40%) of rock and (3) virtually no bedrock. Evidence of major erosion within the last year exists.
15. Streambank Vegetation      Qualitatively describe the upland or upper streambank vegetation, other than the canopy, according the following:
- 1-conifers (spruce/hemlock)
  - 2-hardwoods (alders)
  - 3-shrubs (salmonberry, blueberry, etc.)
  - 4-forbs (skunk cabbage)
  - 5-grasses/sedges (muskeg)
16. Stream Canopy Cover      Qualitatively describe the stream canopy by standing midstream looking up and noting the canopy as:
- 1-complete (66-100%) coverage of stream
  - 2-moderate (33-66%) coverage of stream
  - 3-open (0-33%) coverage of stream
17. Rearing Areas      Estimate percent of the sample section which is good salmonid rearing area. Describe qualitatively the rearing habitat under comments.
18. Streambottom Substrate      Record quantity (in percent) of all substrate sizes according to the following types.
- 1-boulder (greater than 256 mm, 10")
  - 2-large cobble (129-255 mm, 5"-10")
  - 3-small cobble (65-128 mm, 2 1/2-5")
  - 4-gravel (2-64 mm)
  - 5-sand/silt (2mm)
  - 6-organic muck
  - 7-other, coded as:
    - a-bedrock
    - b-sunken log
    - c-decaying vegetable matter
    - d-other

19. Fish Species  
Identification

Collect and identify fish species and determine their general distribution and relative abundance. The surveyor has the option to use a fine-meshed dip net, stream seine, or electro-fishing unit, but minnow traps, baited with preserved pink salmon eggs, are recommended. As a hint, when using a dip net squirt some pureed pink salmon eggs into a pool, then scoop up the fish. Enter the appropriate code from key into item 19 and write notes under comments about general distribution and relative abundance.

KS - king salmon	DV - Dolly Varden
SS - silver salmon	RT - rainbow trout
RS - red salmon	CT - cutthroat trout
CS - chum salmon	SM - smelt
PS - pink salmon	ST - steelhead
NP - northern pike	BT - brook trout
CO - cottids	GR - grayling
LT - lake trout	WH - whitefish
SB - stickleback	BU - burbot
	OT - other

20. Fish Sampling

Fill out a fish sampling form R-10 2600-5 (1/81) if fish are captured during the survey. Enter yes or no if a form is completed.

21. Comments

Note such things as:

- past logging signs
- icing scars on bark of trees or banks
- vegetation (moss, grass) growing in streambed
- blue clay deposits along banks or streambed
- beaver or other haulouts along banks
- bird species sited
- bear sign and trails
- windfalls in vicinity of the stream and direction of fall
- bedrock and substrate types such as shale, sandstone, granite, etc.

330.44 - Office Work Done After Fieldwork. After completing field work, the following things should be done to data in office setting.

1. Diagrammatic Map      Draw a single line schematic map on gridded paper using the information from the survey. The scale should be 4" to the mile at a minimum. One way to do it is trace the streamcourse over an aerial photo. Then include on the map:
  - 1-notations marking boundaries of the 100 meter (or less) sections.
  - 2-mark upper limits of spawning area if known.
  - 3-mark barriers.
  - 4-mark upper limits of anadromous habitat if known.
  - 5-mark obvious soil hazard conditions such as V-notches, slumps, mass wasting, blue clay, braided stream channels and windthrow areas as they relate to the stream.
  - 6-mark water flow direction.
  - 7-mark elevation of each sample site. Use topo map as data source and record to the nearest 100 feet.
2. Narrative      Write a general narrative highlighting:
  - 1-special entries on the diagrammatic map.
  - 2-summarizing anything unusual from the comments sections.
  - 3-generalize about the quality of spawning and rearing habitat.
  - 4-explain any deviations from the prescribed survey procedure.
3. Photos      Mount photos on paper and type a clear legend under each one. Include in the legend:
  - 1-date
  - 2-survey area
  - 3-section numberEstablish a filing system for negatives.

4. Forms  
Copy or type forms over if necessary for clarity or ease in further duplicaiton.
5. Binding  
Arrange forms and photos for an entire stream or survey area into a booklet. Put narrative first, then schematic map(s), then forms following each form with its accompanying photos. If the stream is divided into survey areas, arrange all forms relating to section A first, followed by B, etc.
6. Duplication and Distribution  
Duplicate and distribute the booklet as directed by the Area/Forest Program Manager.

APPENDIX B

Level II Fisheries Surveys Handbook

Modified Level III  
Final Methodology Will be Available  
in Late 1984 from the  
Regional Forest Service Office

320.3 - LEVEL TWO surveys are generated by field work and should contain enough information to attempt answers to questions about what fisheries habitat is there and relative amounts of it. There should also be adequate information to determine whether potential enhancement or rehabilitation opportunities exist. The data derived at Level II is generally not statistically reliable within reasonable confidence limits.

Definition of When to Use. Level II surveys are used when general observations are needed about the fishery habitat of a specific stream. Questions like, "Where is the actual streamcourse as compared to habitat?"; or even, "Approximately how much spawning area is available?"; can be answered.

How to Use. Mainly, the data is used in situations where a question comes up about an area and the user examines all the data and tries to formulate a general answer. In addition there are some specific figures that can be assimilated out of the data. A partial list of these figures follows:

1. Available spawning area (gravels between 2-128 mm in diameter) contained in the survey area. The figure should be used with caution; under no circumstances would any particular species of salmon utilize all that area to an optimum.
2. Amount of the stream that is pool according to our rule that a pool is any section of water flowing at less than 30cm/sec.
3. Amount of debris in the survey area.
4. Water temperature data may be used for tracking entry of different water sources to the stream. Groundwater sources may even be noted since it is frequently two or more degrees cooler. Final interpretation of the data is the responsibility of the user.

#### Equipment Needed

Level Two Survey Forms

Section 330.4 of the handbook reproduced on waterproof paper

Field notebook

Pencils

Maps, USGS quads and aerial photographs

50 meter tape measure

Abney level or clinometer

Camera with film

Minnow traps (6) and bait

Tricaine methanesulfanate

Dip net



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320.41--1

Fish measuring ruler (metric)  
Range finder  
Pocket altimeter  
pH meter  
Scientific sampling permit

320.4 - Procedure. There are several phases of data collection for Level Two survey: preplanning before starting field work; field work broken down into data that is entered once for each survey area; data that is entered once at least every 100 meters along the stream; and office work to be done after the field work.

320.41 - Preplanning and data collection before starting field work includes the following: Make required entries once for every survey area on the first part of form 2600-3a (1/81).

1. Survey Areas            Use ADF&G numbering system.
2. Historical Fish        List species observed or sampled by entering the appropriate species code.

KS - king salmon	DV - Dolly Varden
SS - silver salmon	RT - rainbow trout
RS - red salmon	CT - cutthroat trout
CS - chum salmon	SM - smelt
PS - pink salmon	ST - steelhead
NP - northern pike	BT - brook trout
CO - cottids	GR - grayling
LT - lake trout	BU - burbot
SB - stickleback	OT - other

FISHERIES SURVEY HANDBOOK  
(In Revision)

320.42--1

320.42 - Data entered once per survey area. The following items should be recorded on the second part of form 2600-3a (1/81) while at the stream once for each survey area.

(Data Order)

<u>Item</u>	<u>Explanation</u>
1. Stream Name	Record the stream name as listed on the map or as commonly known.
2. ADF&G Catalog No.	Enter appropriate State Fish and Game Catalog number and sub-numbers for stream surveyed.
3. Latitude and Longitude	Record the latitude and longitude to the nearest five seconds for the lower end of the survey area. Use appropriate geodetic scale to interpolate precise latitude and longitude off a USGS quad. Identify the USGS quadrangle and legal description.
4. Agency Unit	Enter the appropriate land area code as assigned to each agency.  02 Stikine 10-19 BLM 03 Chatham 20-29 National Park 04 Chugach 30-39 State Park System 05 Ketchikan 40-49 F&WS 50-69 Native Corporations
5. Management Area	Enter the appropriate agency subunit code and VCU Number. (List of management area code to be developed and distributed by each agency).
(7.) 6. Aerial Photo Number	If an aerial photo is used, record the flight line, roll, photo, year and grid.
(9.) 7. Access	Enter up to two codes from this list:  1. Roaded (list road number) 2. Unroaded
(10.) 8. Land Use	a. Note any activities associated with man's present use or planned use such as logging, mining, roads, dump sites, etc.  b. Note any evidence of historical land use such as logging (and approximate year), mining, abandoned cannery sites, etc.

(Data Order)

(14.) 9. Flow Stage

Enter best estimate as to flow at time of survey. (See glossary for diagram of terms).  
1 = low; 2 = normal; 3 = high

(15.) 10. Temperature

A temperature sensitive stream is identified as a stream where water temperature will rise to undesirable levels if shade producing canopy is removed. Stream gradient (measured elsewhere), substrate composition (measured elsewhere), and stream water source are critical factors affecting temperature increases. Stream orientation (south-southwesterly orientated streams have the highest degree of susceptibility for adverse temperature changes) is also critical. Only streams between 55-57° latitude (Ketchikan to Sitka) need to be included in temperature sensitivity analysis since adverse increases have not been found to be present above 57° latitude (Sheridan 1977). Streams with average widths greater than 75 feet should also not be included, since the effect of tree shading is minimized as the stream becomes larger.

Enter appropriate codes describing source of water at that point on the stream.

- |                 |                       |
|-----------------|-----------------------|
| 1 - lake        | 4 - muskeg            |
| 2 - glacial     | 5 - surface runoff    |
| 3 - groundwater | 6 - subsurface runoff |
| 7 - other       |                       |

c. pH, record to nearest .5 increment using a Universal Wide-range color wheel or electronic pH meter. The pH should be taken above the intertidal zone.

(Data Order)

- (21.) 11. Intertidal Zone    An intertidal zone is defined as that portion of the stream channel between the high, high water mark (generally tree line) to the edge of the saltwater (if available, low, low water mark). If there is an intertidal zone within the survey area take following data:
- a. Gradient in the intertidal zone measured with a clinometer or abney level. Record to nearest .5 percent.
  - b. Bottom Type: estimate
    - % fines (2mm or smaller)
    - % gravel/small cobble (2-128mm)
    - % large cobble/boulders/bedrock (128mm+)
    - the sum should equal 100%
  - c. Available spawning area: estimate quality as poor, fair, good or excellent.
  - d. Note yes or no whether schooling areas are present in the estuary or lower sections of the stream. If yes, describe in comments.
  - e. If survey coincides with low tide, note yes or no shellfish potential, and if yes, describe in comments.
  - f. Describe known anchorages, or ones used during the survey, and their exposure.
- (22.) 12. Comments    Add any comments that are important to the aquatic resources or required to answer other items on the list.
- (23.) 13. Investigators    Enter names of people doing the field work.
- (24.) 14. Date    Enter numerical designation for Month/Day/Year.
- (20.) 15. Weather Conditions    Enter the appropriate code from the key. If there is an unusual situation, enter in comments.
- |             |           |                   |
|-------------|-----------|-------------------|
| 1 - rain    | 2 - clear | 3 - overcast      |
| 4 - snowing | 5 - fog   | 6 - partly cloudy |

16. Photos

At least one black and white print photo is required for every survey area and at every readily identifiable change in habitat type, unique situation, barrier falls, and the intertidal area. Photos should be taken facing upstream unless specifically noted in the photo records.

Since it is impossible to look back at several rolls of film and properly label them, prior identification is needed. Make a label with the date, stream name, survey area, and section number written on it and photograph it in the frame immediately preceding the frame of the stream. In addition record each photo in a notebook. Number each roll with a number on the film canister before use. As an example, the first roll of film being used by Jim Doyle in 1979 would be labeled JD-79-1, the second, JD-79-02, etc. Under this number in his notebook he would list each photo as it's being taken and identify date, stream name, survey area, and section number.

Record the roll number and how many photos were taken in the space on the form.

320.43 - Data Entered Once Every 500 Meters. The following items should be recorded on form R-10 2600-3b (1/81) while at the stream once for at least every 500 meter section of stream in the survey area. The form is designed to have one column filled in for each successive reach (see glossary) identified by item 1, section number.

(Data Order)

- |                       |  |
|-----------------------|--|
| (1.) 1. Section       | The stream is divided into sequential samples at least every 500 meters. Numbering should start at the furthest downstream point and increase consecutively upstream. Sections in the intertidal zone should be labeled with the code "I". |
| (4.) 4. Gradient      | Measure gradient over the section being surveyed with a clinometer or abney level. Record to nearest 1/2 percent.  |
| (5.) 3. Water Quality | Enter appropriate codes from key:<br><div style="margin-left: 100px;">color: 1-clear      2-glacial<br/>         3-light tan 4-tan</div>   |

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- (14.) 4. Available Spawning
- a. Percent ASA: recorded ASA as an estimated % of the stream area being surveyed.
  - b. % ASA is defined as the % of gravel 2-128mm in size in shallow fast and shallow slow water types.
- (11.) 5. Water Width
- a. Record active channel width to the nearest 1/10 meter. Active channel width is defined as to the edge of streamside vegetation.
  - b. Record water width (bankfull stage) to the nearest 1/10 meter. Width of multiple channels should be recorded separately.
  - c. Identify channel braiding and off-channel scanning areas.
- (12.) 6. Water Type
- a. Categorize water type according to key as:
    - SS - shallow (50 cm deep), slow (30cm/sec)
    - SF - shallow (50 cm deep), fast (30cm/sec)
    - DS - deep (50 cm deep), slow (30 cm/sec)
    - DF - deep (50 cm deep), fast (30 cm/sec)
  - b. Measure the lineal length of undercut banks (in meters). Undercut banks are defined as areas under streambanks large enough to hide fish.
- (9.) 7. Debris Loading
- Estimate percent area covered in pools by debris. Picture all the debris in pools for that section piled up in one place and compute the % area it would cover.
- \*Dennis Hubartt will provide additional information.
- (8.) 8. Streambank Vegetation
- Qualitatively describe the upland or upper streambank vegetation, other than the canopy, according to the following:
- 1. Floodplains
    - Spruce
    - Alder/cottonwood
    - Devil's Club
    - Salmonberry
    - overflow channels
    - overland flooding

(Data Order)

(8.) 8. Streambank  
Vegetation  
(Cont.)

Qualitatively describe the upland or upper streambank vegetation, other than the canopy, according to the following:

2. Foothslopes not flooded (good containment)

Hemlock  
Blueberry

3. Edge of Muskegs

Blueberry  
Sedge  
Hemlock

4. Unstable Ground

Alder/Salmonberry  
Hemlock/Alder/Salmonberry

Muskeg

Sedge

9. Rearing Areas

For "Pool rearing" species determine:

- a. total reach area
- b. % shallow slow  
% deep slow
- c. % debris in pools
- d. length of undercut bank

For "Riffle rearing" species determine:

- a. total reach area
- b. % shallow fast  
% deep fast
- c. % cover in riffles

For "Lake rearing" species determine

- a. Morphocadaphic index

(Data Order)

- (13.) 10. Streambottom Substrate      Record quantity (in percent) of all substrate sizes according to the following types (from soil conservation service).
- 1 - boulders (250mm, 10")
  - 2 - large cobble (129-250mm, 5-10")
  - 3 - small cobble (65-128mm, 2.5-5")
  - 4 - gravel (2-64mm)
  - 5 - sand (2.0-.1mm)
  - 6 - organic muck
  - 7 - other, coded as:
    - a - bedrock
    - b - sunken log
    - c - decaying vegetable matter
    - d - other
- (18.) 11. Fish Species Identification      Collect and identify fish species and determine their general distribution and relative abundance. The surveyor has the option to use a fine-meshed dip net, stream seine, or electro-fishing unit, but minnow traps, baited with preserved pink salmon eggs, are recommended. As a hint, when using a dip net, squirt some pureed pink salmon eggs into a pool, then scoop up the fish. Enter the appropriate code from key into item 19, method of capture, and note under comments the general distribution and relative abundance (high, medium, low).
- |                    |                      |
|--------------------|----------------------|
| KS - king salmon   | DV - Dolly Varden    |
| SS - silver salmon | RT - rainbow trout   |
| RS - red salmon    | CT - cutthroat trout |
| CS - chum salmon   | SM - smelt           |
| PS - pink salmon   | ST - steelhead       |
| NP - northern pike | BT - brook trout     |
| CO - cottids       | GR - grayling        |
| LT - lake trout    | WH - whitefish       |
| SB - stickleback   | BU - burbot          |
| OT - other         |                      |
- (19.) 12. Fish Sampling      Fill out a fish sampling form R-10 2600-5b (1/81) if fish are captured during the survey. Enter yes or no if a form is completed.



(Data Order)

(22.) 13. Comments

- past logging signs
- icing scars on bark of trees or banks
- vegetation (moss, grass) growing in streambed
- blue clay deposits along banks or streambed
- bird species sighted
- bear sign and trails
- windfalls in vicinity of the stream and direction of fall
- bedrock and substrate types such as shale, sandstone, granite, etc.

- Beaver

- active beaver dam
- inactive beaver dam, good repair
- inactive beaver dam, poor repair
- old dam, little effect on stream
- no beaver activity
- beaver activity but no dams

- Aquatic Vegetation

- mosses
- filamentous algae
- periphyton
- vascular plants
- density
  - dense (abundant vegetation on rocks or over the entire area)
  - medium (1/2 of all rocks with vegetation)
  - sparse (vegetation seldom observed)

- Potential Barriers

1 - velocity	4 - beaver dam
2 - falls	5 - manmade
3 - debris jam	6 - other

Photograph the barrier.

320.44 - Office Work Done After Fieldwork. After completing field work, the following things should be done to data in office setting.

1. Diagrammatic Map      Draw a single line schematic map on gridded paper using the information from the survey. The scale should be 4" to the mile at a minimum. One way to do it is to trace the streamcourse over an aerial photo. Then include on the map:
  - 1 - notations marking boundaries of the 500 meter (or less) sections.
  - 2 - mark upper limits of spawning area if known.
  - 3 - mark barriers.
  - 4 - mark upper limits of anadromous habitat if known.
  - 5 - mark obvious soil hazard conditions such as V-notches, slumps, mass wasting, blue clay, braided stream channels and windthrow areas as they relate to the stream.
  - 6 - mark water flow direction.
2. Narrative              Write a general narrative highlighting:
  - 1 - special entries on the diagrammatic map
  - 2 - summarizing anything unusual from the comments sections.
  - 3 - generalize about the quality of spawning and rearing habitat.
  - 4 - explain any deviations from the prescribed survey procedure.
3. Photos                 Mount photos on paper and type a clear legend under each one. Include in the legend:
  - 1 - date
  - 2 - survey area
  - 3 - section numberEstablish a filing system for negatives.
4. Forms                  Copy or type forms over if necessary for clarity or ease in further duplication.

5. Binding                      Arrange forms and photos for an entire stream or survey area into a booklet. Put narrative first, then schematic map(s), then forms following each form with its accompanying photos. If the stream is divided into survey areas, arrange all forms relating to section A first, followed by B, etc.
6. Duplication and              Duplicate and distribute the booklet as  
Distribution                      directed by the Area/Forest Program Manager.

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